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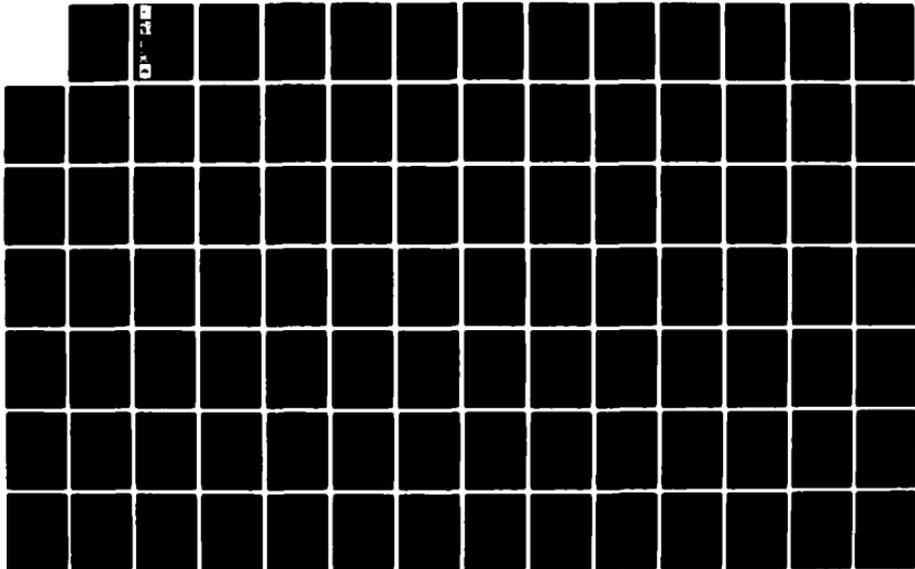
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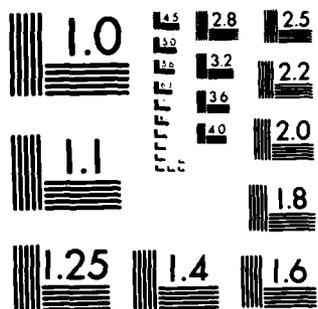
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# COMPENDIUM OF ABSTRACTS ON STATISTICAL APPLICATIONS IN GEOTECHNICAL ENGINEERING

by

Mary Ellen Hynes-Griffin, G. W. Deer, Editors

Geotechnical Laboratory

U. S. Army Engineer Waterways Experiment Station  
P. O. Box 631, Vicksburg, Miss. 39180

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US Army Corps  
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The results of a literature search of geotechnical and statistical abstracts are presented in tables listing specific topics, title of the abstract, main author and the file number under which the abstract can be found.		

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PREFACE

This compendium of abstracts on Statistical Applications in Geotechnical Engineering was compiled by personnel of the Earthquake Engineering and Geophysics Division (EEGD), Geotechnical Laboratory (GL), U. S. Army Engineer Waterways Experiment Station (WES). This literature search is part of CWIS Work Unit No. 31755 on Probabilistic Methods in Engineering Geology. This work unit is part of the Rock Research Program in the Materials Research Area for Civil Works Research and Development.

The abstracts listed within do not necessarily reflect the policies of the U. S. Army Corps of Engineers.

The list of abstracts was compiled and edited by Ms. Mary Ellen Hynes-Griffin, Dr. G. Wendell Deer and Ms. Linda L. Buege, EEGD. The work was performed under the general supervision of Dr. A. G. Franklin, Chief, EEGD, and Dr. William F. Marcuson, III, Chief, GL.

COL Tilford C. Creel, CE, was Commander and Director of WES during the preparation of this report. Mr. F. R. Brown was Technical Director.

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APPENDIX B: STATISTICAL TECHNIQUE INDEX . . . . .	B1
APPENDIX C: NTIS (FILE 6) . . . . .	C1
APPENDIX D: COMPENDEX (FILE 8) . . . . .	D1
APPENDIX E: GEOARCHIVE (FILE 58) . . . . .	E1
APPENDIX F: GPO MONTHLY CATALOGUE (FILE 66) . . . . .	F1
APPENDIX G: GEOREF (FILE 89) . . . . .	G1

COMPENDIUM OF ABSTRACTS ON STATISTICAL APPLICATIONS  
IN GEOTECHNICAL ENGINEERING

PART I: INTRODUCTION

1. Interest and research in the application of probabilistic and statistical methods to soil mechanics, rock mechanics, and engineering geology problems have grown markedly over the past 2 decades. Evidence to support this observation comes from an ongoing 6-year research program on this subject that began in January 1982 at the U. S. Army Engineer Waterways Experiment Station. In order to survey current applications of probability and statistics in geotechnical engineering, an extensive, computer-assisted literature search was conducted through the DIALOG Information Retrieval Service from DIALOG Information Services, Inc. The search covered the period September 1961 through September 1982. Five computerized abstract services were contacted: NTIS (from the National Technical Information Service, NTIS, U. S. Department of Commerce, Springfield, Virginia), COMPENDEX (from Engineering Information, Inc., New York), GEOARCHIVE (from Geosystems, London, England), GPO Monthly Catalogue (from the U. S. Government Printing Office, Washington, D. C.), and GEOREF (from the American Geological Institute, Falls Church, Virginia). A total of 1886 abstracts were obtained from logical combinations of the key words: probability, statistics, soil mechanics, rock mechanics, and engineering geology.

2. The purpose of this report is to make available to the U. S. Army Corps of Engineers this specific collection of abstracts in a usable form. The abstracts have been indexed in two ways: First, by the geotechnical subject addressed, and second, by the statistical or probabilistic technique employed. Although probability theory is the underlying mathematical theory for statistics and statistics can be described as the application of probability theory to analyze data, the word "statistical" will be used throughout the remainder of this report to mean both "statistical" and "probabilistic." Descriptions of the Subject Index (in Appendix A) and of the Statistical Technique Index (in Appendix B) follow. The abstracts are placed in the Appendices according to their source: Appendix C: NTIS (File 6), Appendix D: COMPENDEX (File 8), Appendix E: GEOARCHIVE (File 58), Appendix F:

GPO Monthly Catalogue (File 66), and Appendix G: GEOREF (File 89). The abstracts appear generally in reverse chronological order within each file.

## PART II: GEOTECHNICAL SUBJECT INDEX

A review of the 1886 items obtained led to the selection of the 50 geotechnical subject areas listed in Table 1. For each subject area, the abstracts are listed by file code (given in Table 2) which identifies which Appendix the abstract is located in, page number (within the file), first author's last name, and title of the paper. This information uniquely identifies any abstract in Appendices C through G. The location of this key information on a typical page of abstracts is shown in Figure 1.

The subject areas appear in alphabetical order in the Subject Index in Appendix A. The papers appear, roughly, in reverse chronological order. To use the subject index, select the subject areas in Table 1 that best correspond to the specific subject of interest, look up these subject areas in Appendix A, scan the main author's names and titles of the papers for each subject area, and select a final list of abstracts to be looked up in Appendices C through G. For example, if one is interested in statistical approaches to rock slope stability, one might select subject areas: Rock Slope Stability and Pit Mines; Rock Fractures and Joints; Rock Strength, Stress and Deformation; and Statistical Analysis of Rock Mechanics and Engineering Geology Data. From the subject area index, Rock Slope Stability and Pit Mines, suppose the abstract of a paper by McMahon on page 2213 of File 8 (COMPENDEX) was selected. One would look in Appendix D for File 8 (from Table 2) and search for file page 2213. This abstract can then be identified by the title and main author's last name. This particular abstract is shown in Figure 1.

**Table 1**  
**List of Geotechnical Subjects Indexed**

---

<b>Blasting, Impact Loading and Cratering</b>	<b>Rock Fragmentation and Crack Propagation</b>
<b>Buried Structures</b>	<b>Rock Mass Classification</b>
<b>Compaction and Quality Control</b>	<b>Rock Permeability</b>
<b>Conference Proceedings and Indices</b>	<b>Rock Slope Stability and Pit Mines</b>
<b>Deep Foundations and Anchors</b>	<b>Rock Strength, Stress and Deformation</b>
<b>Dynamic Response Analysis</b>	<b>Seepage, Soil Permeability and Piping</b>
<b>Earthquake Engineering, Seismology, Seismic Risk Analysis and Response Spectra</b>	<b>Settlement and Heave</b>
<b>Faulting, Folding and Volcanoes</b>	<b>Shallow Foundations</b>
<b>Frozen Ground</b>	<b>Site Investigation Planning</b>
<b>General References</b>	<b>Slurry Trench Walls</b>
<b>Geophysical Testing of Rock</b>	<b>Soil Fabric</b>
<b>Geophysical Testing of Soils</b>	<b>Soil Slopes, Embankments, Dams and Excavations</b>
<b>In-Situ Testing of Soils</b>	<b>Soil Strength and Constitutive Models</b>
<b>Landslides and Avalanches</b>	<b>Soil-Structure Interaction: Static and Dynamic Loading</b>
<b>Land Use and Regional Planning</b>	<b>Statistical Analysis of Rock Mechanics and Engineering Geology Data</b>
<b>Lifelines and Pipelines</b>	<b>Statistical Analysis of Soil Mechanics Data</b>
<b>Liquefaction, Dynamic Soil Properties and Dynamic Design</b>	<b>Stratigraphic Correlation, Mapping and Regional Surveys</b>
<b>Nuclear Power Plants</b>	<b>Subsidence</b>
<b>Offshore Technology</b>	<b>Trafficability</b>
<b>Pavements</b>	<b>Underground Openings: In-Situ Testing, Design and Performance</b>
<b>Petroleum and Geothermal Engineering</b>	<b>Underground Storage and Waste Disposal</b>
<b>Reinforced Soil</b>	
<b>Reliability, Decision Analysis and Optimization</b>	
<b>Remote Sensing and Terrain Analysis</b>	
<b>Retaining Walls and Braced Excavations</b>	
<b>Rock Fabric</b>	
<b>Rock Foundations</b>	
<b>Rock Fractures and Joints</b>	

---

Table 2  
Abstract Services and File Codes

<u>Abstract Service</u>	<u>File Code</u>	<u>Appendix</u>
NTIS (National Technical Information Service)	6	C
COMPENDEX	8	D
GEOARCHIVE	58	E
GPO Monthly Catalogue	66	F
GEOREF	89	G

FILE IDENTIFICATION  
NUMBER AND NAME

MAIN AUTHOR'S LAST NAME

FILE PAGE NUMBER

DIALOG FILES COMPENDEX

10 02/AUG (Copr. Engineering Information Inc.) See ?NEWS (Item 253 of 317) User 5208 18pp82

2213

519471 ID NO. 01/50319171

**DESIGN OF ROCK SLOPES AGAINST SLIDING ON PRE-EXISTING**

**FRACTURES.**

McMahon, Gary K.  
Int Soc for Rock Mech, 3rd Congr, Proc, Pap, Denver, Colo,  
Sep 1-7 1974 v 2, Part B, p 803-808. Available from NAS,  
Washington, DC, 197

Procedures are presented for the design of slopes in rock of sufficient strength that failure will take place mainly by sliding along rock fractures, and that failure through the rock substance will be restricted to the relatively highly stressed region near the toe of the slope. A single parameter, the critical dip, is introduced to combine the effects of shear strength, groundwater forces, earthquake forces, and geometry of the slide mass. Blocks resting on fractures inclined at angles less than the critical dip are stable for all orientations. Fracture orientations are then analyzed statistically to evaluate the probability of the slope undercutting a fracture, or combination of fractures, dipping out of the slope at angles greater than the critical dip. The probability of failure is then obtained by multiplying the probability of the fractures having unstable orientations by the probability that the maximum lengths of the fractures are sufficient to allow failure. The statistics of fracture lengths are treated as an application of the Theory of Extreme Values. The optimum design slope is selected as the slope at which the estimated total present value of the costs of waste excavation, landslide repair, and lost production are a minimum. 7 refs.

DESCRIPTORS: ROCK MECHANICS, (GEOLOGY, Tectonics).  
IDENTIFIERS: SLOPE STABILIZATION, LANDSLIDE PREVENTION  
CARD ALERT: 481, 482, 502

517003 ID NO. - E1750317003

**RESULT OF STATE-OF-STRESS MEASUREMENTS IN DIFFERENT**

**ROCK MASSES.**

Martineti, S.; Ribacchi, R.  
Ital State Electr Board, Italy  
Int Soc for Rock Mech, 3rd Congr, Proc, Pt  
Sep 1-7 1974 v 2, Part A, p 458-463.  
Washington, DC, 197

Results of \$left double quotes\$ in measurements of stresses in rock \$right double quotes\$ in underground caverns for hydroelectric different locations with the \$left double quotes\$ doorstopper\$ right double quotes\$ are exposed. The paper also deals upon statistical models, interpretation of the results, practical execution of measurements. 13 refs.  
DESCRIPTORS: (+HYDROELECTRIC)  
ROCK MECHANICS, STRAIN  
CARD ALERT: 422.

ABSTRACT OF INTEREST

Figure 1. Location of key information necessary to find abstracts in the Appendices

### PART III: STATISTICAL TECHNIQUE INDEX

Whenever a particular statistical technique was mentioned in the abstract, this technique was then included in the Statistical Technique Index. Since many of the abstracts (more than 50 percent) do not specify the technique used, this index is less comprehensive (with respect to all the abstracts) than the Geotechnical Subject Index. A total of 12 statistical techniques were identified during the review of the abstracts. These are listed in alphabetical order in Table 3. The Statistical Technique Index, given in Appendix B, is organized in the same manner as the Geotechnical Subject Index. The statistical techniques headings appear alphabetically in the index, and for each heading, the appropriate file codes, page numbers, main author's last names, and titles are listed. For instance, to find examples of the use of multiple linear regression in geotechnical problems, one would scan the list of abstracts in the statistical technique heading, Multiple Linear Regression, and look up the selected abstracts in Appendices C through G.

Table 3

List of Statistical Techniques Indexed

---

Analysis of Variance

Bayesian Statistics

Correlations

Discriminant Analysis

Factor Analysis

Markov Processes

Multiple Linear Regression

Probabilistic Modeling

Risk Analysis

Simulation

Stochastic Techniques

Time Series Analysis

APPENDIX A: GEOTECHNICAL SUBJECT INDEX

Blasting, Impact Loading and Cratering

<u>Page No.</u>	<u>Main Author</u>	<u>Title</u>
<u>File 6</u>		
2093	Abildskov	Investigation of blast resistant water well concepts
2095	Isenberg	Statistical estimations of geological material model parameters from cylindrical in-situ test data
2097	Smith	Pressure and gravity effects on the simulation of meteorite impact craters
2097	Ayala	Experimental stress analysis of overpressure facility for Project Hest II, Minuteman Missile Site D-1
2100	Dillon	The influence of soil and rock properties on the dimensions of explosion-produced craters
2102	Stavnitser	Formation of elastoplastic deformations of soil under impact compression
2111	Rollins	Penetration in granite by shaped charge liners of various metals
2129	Van Dyke	Fracture of rock due to high pressure, short duration loadings
2143	Morrey	Underground explosion theory
<u>File 8</u>		
2188	Lutton	Probability of specified ground vibrations from blasting
2206	Ko	Dynamic behavior of pit slopes in response to blasting and precipitation
<u>File 58</u>		
2229	Pozdnyakov	A statistical approach to determination on the pressure at an explosives - rock boundary
<u>File 89</u>		
1835	Pelz	Finite element study on earth covered structures subject to blasting and impact loading
1998	Nelson	Numerical solution of problems involving explosive loading
2014	Santich	Dynamic models of rock blasting
2027	Lutton	Probability of specified ground vibrations from blasting
2053	Schubart	Influence of the blasting technique and the structure of the deposit on the intensity and distribution of earthquakes caused by blasting
2108	Lynch	Distance attenuation of response spectral data from underground nuclear detonations
2240	Lutton	Probability of specified ground vibrations from blasting

Buried Structures

<u>Page No.</u>	<u>Main Author</u>	<u>Title</u>
<u>File 89</u>		
1920	Rude	A study of the imperfect ditch method for rigid culverts
1835	Pelz	A finite element study on earth covered structures subjected to impact loading
1980	Kay	Design approach for circular buried conduits
1981	Quigley	Earth pressures on conduits and retaining walls
2046	Duncan	FEM analysis of buried flexible metal culvert

Compaction and Quality Control

<u>Page No.</u>	<u>Main Author</u>	<u>Title</u>
<u>File 6</u>		
2090	Brabston	Investigation of compaction criteria for airport pavement subgrade soils
2104	Torrey	Analysis of field compaction data
2123	Jorgenson	The statistical approach to quality control in highway construction Phases II and III
2130	Smith	Investigation into the uses of statistical procedures in specification writing and quality control
2130	Jorgenson	The statistical approach to quality control in highway construction, Phase I
2135	Blackwell	An investigation of nuclear methods of determining moisture contents and the compacted densities of soils and aggregates
2135	David	Quality control of construction by statistical tolerances
2136	McDonald	Statistical quality control study base course
2138	Watkins	Applications of statistical specifications for highway construction
2139	Van Houten	Characteristics of compacted embankments
2139	Nielson	Characteristics of compacted bases and subbases
2140	Williamson	An investigation of compaction variability for selected highway projects in Indiana
2142	Shah	Quality control analysis, Part II
2142	Sherman	A statistical analysis of embankment compaction
2144	California Division of Highways	A basic study of the nuclear determination of moisture and density
<u>File 8</u>		
2149	Lovell	Compactive prestress in shales
2188	Maul	Determination of the bulk density of cohesionless soils in inclined ground
2220	Kraft	Acceptance specification of compacted soils
<u>File 58</u>		
2233	Sherard	Discussion of Kotzias et al., statistical quality control at Kastraki earth dam
2233	Coumoulos	Discussion of Kotzias et al., statistical quality control at Kastraki earth dam
2233	Kotzias	Statistical quality control at Kastraki earth dam
<u>File 89</u>		
1888	Carroll	Compaction of dry or fluid-filled porous materials
1895	Essigmann	Method for specifying soil compaction
1896	Livneh	Using indicative properties to predict the density-moisture relationship of soils
1896	Vanzyl	Storage, retrieval, and analysis of compacted shale data
1896	Price	Predicting field compacting strength and variability
1900	Ozawa	Application of numerical methods to design and construction control of soil structures in Japan
1933	Aggour	Analytical determination of earth pressure due to compaction
1991	Soares	Application of the statistical method in control of compaction of soils

Conference Proceedings and Indices

<u>Page No.</u>	<u>Main Author</u>	<u>Title</u>
<u>File 6</u>		
2127	Berg	NSF-UCEER Conference on Earthquake Engineering Research, March 10-11, 1967, California Institute of Technology, Pasadena, California
<u>File 8</u>		
2164		5th International Conference on Port and Ocean Engineering under Arctic Conditions, Trondheim (1979)
2169		3rd International Conference on Numerical Methods in Geomechanics, Aachen (1979)
2174		3rd International Conference on Applications of Statistics and Probability in Soil and Structural Engineering, Sydney (1979)
2176		2nd South Pacific Regional Conference on Earthquake Engineering, Wellington (1979)
2198		2nd International Conference on Application of Statistics and Probability in Soil and Structural Engineering, Aachen (1975)
2220		4th Annual Offshore Technology Conference, Houston (1972)
2220		International Conference on Microzonation for Safer Construction Research and Application, Seattle (1972)
2221		North American Rapid Excavation and Tunneling Conference, Chicago (1972)
<u>File 58</u>		
2234		Comprehensive dissertation index supplement A73, Volume 2, Sciences
<u>File 89</u>		
1904	Wittke (Editor)	Numerical Methods in Geomechanics: Vol. 4, Additional Contributions
1991	Schultze (Editor)	Speciality Session 6; The probabilistic approach to soil mechanics design. 9th International Conference on Soil Mechanics and Foundation Engineering, Tokyo, Japan, 1977
2011	Gudehus (Editor)	Finite Elements in Geomechanics, Karlsruhe, Germany, 1975
2063	Mahieu	Methodologic study of the utilization of a card-index of engineering geology data; documentation, cartography, statistical analysis
2072	Lumb	First International Conference on Applications of Statistics and Probability to Soil and Structural Engineering, Hong Kong, 1971

Deep Foundations and Anchors

<u>Page No.</u>	<u>Main Author</u>	<u>Title</u>
<u>File 6</u>		
2108	O'Neill	Behavior of axially loaded drilled shafts in Beaumont clay, Part 3, field tests
2114	Dunlap	Long term overturning loads on drilled shaft footings
2122	Kovacs	Pile driving by means of longitudinal and torsional vibrations
2136	Airhart	Pile-soil system response in clay as a function of excess pore water pressure and other soil properties
2147	Michigan State Highway Commission	A performance investigation of pile driving hammers and piles
<u>File 8</u>		
2150	Dight	Prediction of shear behavior of joints using profiles
2154	Preis	Statistical considerations in pile testing
2155	Balasubramaniam	Performance of friction piles in Bangkok subsoils
2156	Kissenpfennig	Integrity and as-built capacity of bored pile group
2166	McAnally	Ultimate load foundation design using statistically based factors
2173	Madhav	Pile capacity—a reliability approach
2173	Rizkallah	Estimation of the bearing capacity of large bored piles in cohesive soils using statistical methods
2174	Kramer	Applicability of regression analysis to investigate the influences on the carry capacity of ground anchors
2176	Kamey	Relative accuracy and modification of some dynamic pile capacity prediction equations
2178	Stockard	Case histories—pile driving in the Gulf of Mexico
2189	Brenner	Measurement and prediction of vibrations generated by drop hammer piling in Bangkok subsoils
2202	Wagner	Statistical optimization of friction pile foundations
2217	Trow	Temporary and permanent earth anchors
2221	Tejchman	Model investigations of pile groups in sand
<u>File 89</u>		
1827	Kagawa	Lateral pile response during earthquakes
1849	Wang	Method of influence function and its application
1890	Nuti	Dynamic soil-structure interaction in a pile of bridge pile foundations
1900	Parikh	Parametric analysis of axially loaded concrete pile in nonhomogeneous cohesive and cohesionless soil deposits
1915	Wakita	Analysis of group pile foundation subjected to lateral loads by two-dimensional finite element method
1919	Silvandran	Probabilistic analysis of stability and settlement of structures on soft Bangkok clay
1921	Nemec	Skin resistance tests of model piles in hard rocks
1932	Prieto	A finite element method analysis of the earth anchor-soil system
1934	Withiam	Analytical model for drilled shaft foundations
1934	Smith	Installation and performance of piled foundations
1935	Randolph	The effect of pile permeability on the stress changes around a pile driven into clay
1935	Prater	Analysis of laterally loaded piles
1935	Rove	A method for predicting the effect of piles on slope behavior
1936	Bonevjee	An Eulerian formulation of the finite element method for predicting the stresses and pore water pressures around a driven pile
1964	Lytton	Foundations in expansive soils
1965	Poulos	Settlement of pile foundations
1965	Reese	Laterally loaded piles
1971	Boulon	Method for calculating the behavior of piles in extraction
1982	Ottaviani	Observed and predicted test pile behavior
2005	Davis	Numerical approximations in pile-driving analysis
2028	Prieto	Earth anchors; load transfer analysis using photoelastic, analytic, and finite element methods
2034	Goto	Studies on practical idealization of soil-pile-group system concerning dynamic interaction
2071	Costello	Probability and economical foundations
2072	Nair	Response of soil-pile systems to seismic waves
2074	Nottingham	Use of quasi-static friction cone penetrometer data to predict load capacity of displacement piles
2077	Ottaviani	Three-dimensional finite element analysis of vertically loaded pile groups

Dynamic Response Analysis

<u>Page No</u>	<u>Main Author</u>	<u>Title</u>
<u>File 6</u>		
2107	Taylor	Dynamic response of rectangular footings in clay and sand
<u>File 8</u>		
2153	Michalopoulos	Measurement, selection and use of dynamic soil properties in design
2154	Spanos	Statistics of structural responses to seismic waves filtered through rock and soil formations
2158	Gazetas	Random vibration analysis for the seismic response of earth dams
2167	Tomizawa	Identification of a one-dimensional model for a soil-layer-bedrock system during an earthquake
2182	Singh	Stochastic seismic stability prediction of earth dams
2182	Dendrou	Uncertainty finite element dynamic analysis
2196	Crandall	Biaxial slip of a mass on a foundation subjected to earthquake motions
2227	Liu	Spectral simulation and earthquake site properties
<u>File 89</u>		
1825	Plischke	Methods of calculations in the investigation of dynamic loading in rock structures
1833	Pande	Shakedown of elasto-plastic continuum with special reference to soil-rock structures
1834	Aboustit	Finite element linear programming approach to foundation shakedown
1841	Sridharan	Prediction of frequency and amplitude of foundations at resonance
1847	Belkune	Free response of shells on flexible foundation
1847	Chicknagappa	Stiffness coefficients for imbedded footings
1848	Omachi	Analyses of dynamic shear strain distributed in three-dimensional earth dam models
1848	Lin	Seismic deformation of dams by correlative methods
1858	Vrymoed	Dynamic FEM model of Oroville Dam
1858	Lukkunaprasit	Dynamic plastic analysis using stress resultant finite element formulation
1859	Emery	Seismic response of underground openings
1876	Kausel	Transmitting boundaries; a closed-form comparison
1876	El-Shafee	Dynamic axisymmetric soil model for a flexible ring footing
1893	Kunar	A model with non-reflecting boundaries for use in explicit soil-structure interaction analyses
1899	Spanos	Statistics of structural responses to seismic waves filtered through rock and soil formulations
1917	Kawasaki	Seismic response analysis of composite ground treated by deep chemical mixing stabilization method; Part 1, Analytical Method
1923	Goto	Wave propagation and its characteristics due to underground loading
1963	Christian	Two- and three-dimensional dynamic analysis
1963	Roesset	Soil amplification of earthquakes
1987	Matsumoto	A comparison between measured and computed response of Yuda Dam during the July 8, 1976 earthquake; northern Japan
1995	Smith	Analysis of dynamically loaded structures and foundations
1996	Haupt	Numerical methods for the computation of steady-state harmonic wave fields
2020	Dezfulian	Finite element grids for dynamic response analysis
2021	Kuribayashi	An application of finite element method to soil-foundation interaction analysis
2021	Akay	Earthquake analysis of Keban Dam
2021	Naumovski	Earthquake response of continuous media using dynamic relaxation
2021	Hamada	Behaviors of the alluvial layers on the sloped bed rock during earthquakes
2030	Singh	A stochastic method for seismic stability evaluation of earth structures with strain dependent properties
2031	Eskin	Plane vibrations of saturated soil in structural foundation
2031	Moss	The seismic behavior of river valleys
2031	Ayala	Boundary conditions in soil amplification studies
2032	Okamoto	Study of effects of a berm on the stability of rockfill dams during earthquakes
2032	Takevaki	Characteristics of semi-infinite element and its application to dynamic problem
2032	Finn	Seismic analysis of dam-reservoir-foundation systems
2042	Dunger	The dynamic response of gravity platforms
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2065	Faccioli	A stochastic approach to soil amplification
2072	Nair	Response of soil-pile systems to seismic waves
2088	Spang	Numerical dynamic analysis of quartz deformation lamellae and calcite and dolomite twin lamellae
2090	Roth	A factor of safety approach for evaluating seismic stability of slopes
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2192	Anderson	Uniform risk absolute acceleration spectra
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1822	Johnson	Seismic resistance capacity-spent nuclear fuel storage racks
1827	Kagawa	Lateral pile response during earthquakes
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1842	Islami	Seismic aspects of Loughan Dam
1845	Anderson	Consequence of an earthquake prediction on statistical estimates of seismic risk
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1851	Campbell	An empirical analysis of the source of energy release during the Oct. 15, 1979 Imperial Valley earthquake
1853	McLaughlin	Analysis of incoherent energy in near field accelerograms
1853	Ormsby	Probability that another intensity x event could occur in the S.E. during a 200 year period
1853	Schoof	Problems and pitfalls of using Bayesian models for seismic hazard analysis
1854	Evernden	Estimates of intensities and damage for California earthquakes
1856	Shaw	Statistical data for movements on young faults of the conterminous United States; paleo seismic implications and regional earthquake forecasting
1861	Rogers	Comparative ground response studies in Los Angeles using NTS nuclear explosions and San Fernando earthquake data
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1862	Bucknam	Lake Quaternary faulting as a guide to regional variations in long-term rates of seismic activity
1863	Plotnikova	Estimation of the seismic forces of earthquakes for construction taking into account the frequency characteristics of the focal zone in the region
1863	Lyatkher	The statistical behavior of corrected earthquake acceleration forces and the prediction of seismic stresses in complex systems
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1867	McGuire	Statistical uncertainties in seismic hazard evaluations in the United States
1868	Zhurkov	Concentrated criteria for the destruction of solid bodies
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1872	Thenhaus	Probabilistic estimates of maximum seismic horizontal ground motion on rock in coastal California and the adjacent outer continental shelf
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1893	Shepherd	Seismicity and seismic intensities in Jamaica, West Indies; a problem in risk assessment
1908	Oborn	Seismotectonics and dam construction; general report
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1914	Baath	Intensity relations for Swedish earthquakes
1914	Huanven	Experimental studies on the origin of low resistivity-low velocity layer beneath North China Plain and finite analysis for its relationship to seismicity
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1918	Perkins	Probabilistic estimates of maximum seismic horizontal ground motion on rock in the Pacific Northwest and the adjacent outer continental shelf
1920	Riznicenko	The Tashkent-California system of earthquake spectra
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1930	Anderson	Application of seismic risk procedures to problems in microzonation
1931	Farvardhan	Zonation for critical facilities based on two-level earthquakes
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1966	Jurkevics	Autoregressive parameters for a suite of strong-motion accelerograms
1968	Deans	Probabilistic evaluation of the design basis seismic ground motion for Chat Falls site
1969	Anderson	Consequence of an earthquake prediction on statistical estimate of the seismic risk
1970	Basham	Regional assessment of seismic risk in Eastern Canada
1970	Weichert	On Canadian methodologies of probabilistic seismic risk estimation
1972	Stiller	Physical processes in earthquake regions; possibilities of interpretation by means of laboratory experiments on rocks
1976	Mortgat	A Bayesian model for seismic hazard mapping
1979	Matsuda	The relation between subsoil condition and the collapse rate of wooden houses due to the Great Kanto earthquake of 1923 in Yokohama City
1982	Waldo	An approach to seismic zoning in southern New England
1982	Baath	Seismic risk in Fennoscandia
1983	Basili	Macroseismic aspects and seismological and statistical considerations
1983	Hasegawa	Seismotectonics of the Beaufort Sea
1987	Smith	Earthquake risk in New Zealand; statistical estimates
1996	Ohashi	Statistical analysis of strong-motion acceleration records
1998	Harding	Dynamic finite element modeling of near field ground motion from the San Fernando 1971 earthquake
2005	Berry	The sensitivity of low probability seismic risk estimation to seismicity model parameters in eastern Canada
2012	Sadigh	Design response spectra for moderate magnitude local earthquakes at rock and stiff-soil sites
2013	Aggarwal	Earthquakes, faults, and nuclear power plants in southeastern New York-northern New Jersey
2018	Savich	Main directions in investigations of remanent seismic deformations; development of methods of seismic prediction for areas of hydrotechnical structures
2018	Omote	A new approach for estimating earthquake risk
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2019	Karnick	Seismic zoning of the Balkan region
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2020	Grases	Migration of destructive earthquakes in Middle America and associated risk of occurrence
2020	Ahorner	Probability distribution of earthquake accelerations for sites in western Germany
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2027	Ahorner	Probability distribution of earthquake accelerations with applications to sites in the northern Rhine area, Central Europe
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2030	Trifunac	Statistical analysis of the computed response of structural response recorders (SRR) for accelograms recorded in the United States of America
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2035	Stojkovic	Statistic assessment of strong earthquake intensities variation in urban areas
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2038	Yoshikawa	A probabilistic approach to estimate design earthquake for a site in terms of magnitude, epicentral distance and return period
2038	Rikitake	Classification of earthquake prediction information for practical use
2042	Diab	The dam-foundation complex and an explanation of earthquakes due to the filling of certain reservoirs
2051	Mayer-Rosa	Seismic risk maps of Switzerland; description of the probabilistic method and discussion of some input parameters
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2056	Glass	Earthquake injuries related to housing in a Guatemalan village
2056	Marr	Application of linear statistical models of earthquake magnitude versus fault length in estimating maximum expectable earthquakes
2057	Kuribayashi	Relationship between earthquake damage of existing wooden houses and seismic intensities
2057	Hattori	The regional distribution of the earthquake danger in Japan
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2061	Blume	Civil structures and earthquake safety
2062	Brekka	A systematic approach to uncertainty and risk
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2064	Dar Kiureghian	A line-source model for seismic risk analysis
2065	Trifunac	Preliminary empirical model for scaling Fourier amplitude spectra of strong ground acceleration in terms of earthquake magnitude, source-to-station distance and recording site conditions
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2068	Solinas	Artificial earthquake records of prescribed magnitude and focal distance
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2074	Lou	Stochastic simulation of earthquakes
2076	Sharma	A statistical study of Koyana aftershocks for the period January 1968 - October 1973
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2111	Stapp	Analysis of completeness of the earthquake sample in the Puget Sound area and its effect on statistical estimates of earthquake hazard
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2113	Liu	Statistical analysis of 1971 San Fernando earthquake ground-motion data
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2133	Hamilton	Seismic regionalization of eastern Canada
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1862	Bucknam	Lake Quaternary faulting as a guide to regional variations in long-term rates of seismic activity
1887	Cluff	Estimating the probability of occurrences of surface faulting earthquakes on the Wasatch fault zone, Utah
1893	Cluff	Estimating the probability of occurrence of surface faulting earthquakes on the Wasatch fault zone, Utah
1926	Bosi	Deformations in a cover of clays due to movements along faults in the bedrock
1976	Jamison	Elastic-plastic finite element models of forced folds and comparison with specific natural structures
1983	McKague	Recognition of faults in Tertiary-Quaternary alluvium in northern Yucca Flat, Nevada
2017	Brooke	Geomathematical investigation of fault populations at selected locations
2018	Gupta	Stochastic time-series analysis of volcanic events in central Luzon, Philippines
2039	Goodman	The influence of system stiffness and test made on phenomena accompanying stick-slip on fault surfaces
2130	Smith	Investigations into the probability of surface faulting
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2114	Snow, Ice and Permafrost	Investigation of description, classification, and strength properties of frozen soils, Vol. 1
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1831	Saetersdal	Heaving conditions by freezing of soils
1831	Pietrzyk	New formulation of the criteria of frost heave
1832	Jones	Development and applications of frost susceptibility testing
1832	Frivik	Thermal design of artificial soil freezing systems
1832	Jessberger	Optimization of freeze pipe arrangement and necessary refrigeration plant capacity
1925	Canard	Winters statistics; characterization and principal types of winters in France
1928	Mirenburg	Calculation for piles using particle-linear functions
1949	Klein	The application of finite element to creep problems in ground freezing
1981	Klein	Creep stress analysis of frozen soils under multiaxial states of stress
1981	Zaretsky	Ice behavior under load
1981	Johnson	Effect of freeze-thaw cycles on resilient properties of fine-grained soils
1982	Karlov	Frost heave of unsaturated loamy soil under field conditions
2005	Del Giudice	Finite element simulation of freezing processes in soils
2081	Pavlov	Variability of thermal on the surface layer of soils

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2233	Sviridov	Investigation of rocks by mathematical statistical methods
2233	Komarov	Multivariate statistical analysis in engineering geology
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1963	Smith	Numerical and physical modeling
1966	Chandrakant	Introduction, numerical methods, and spectral topics
1966	Desai	Numerical methods in geotechnical engineering
1970	Harr	Mechanics of particulate media; a probabilistic approach
1977	Dvshl	Swiss use of the computer in soil mechanics
1978	Shaw	The role of finite element techniques in applied soil mechanics and foundation engineering
2007	Bannerjee	Boundary element methods in geomechanics
2007	Gallagher	Accuracy in data input and in stress calculations
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2214	Friedman	Investigations of the relations among residual strain, fabric, fracture and ultrasonic attenuation and velocity in rocks
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1867	Broz	Automatic processing of the time sequence of seismo acoustic impulses
1872	Volynets	Statistical characteristics of elastic wave velocities in crystalline rocks under high pressure
1879	Lastovickova	Electric conductivity of young basaltic rocks of central and South-East Slovakia
1880	Lachapelle	Empirical determination of the gravity anomaly covariance function in mountainous areas
1885	Ruths	The reference-correction method for improving the accuracy of seismically locating trapped coal miners
1886	Heyne	Dependence of rock density on chemical oxide contents and ultrasonic velocities
1892	Glushko	Seismo-acoustical anomalies in coal seams of the Donets Basin
1909	Blom	Spectral reflectance and discrimination of plutonic rocks in the 0.45- to the 2.45-mum region
1914	Huanyen	Experimental studies on the origin of low resistivity-low velocity layer beneath North China plain and finite element analysis for its relationship to seismicity
1924	Olhoeft	Physical property statistics or how to hide an anomaly
1927	Olaszowski	A study of rock properties using a petroscope
1970	Sjogren	Seismic classification of rock mass qualities
1980	Samujllo	Relation between size reduction and velocity of travel of a longitudinal ultrasonic wave through samples of certain rocks
2028	Day	Finite element analysis of seismic scattering problems
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2081	Cole	Velocity/porosity relationships in limestones from the Portland group of southern England
2091	Khmelevskoy	The statistical data for the interpretation of complex geological and geophysical investigations
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2127	Melickian	Geophysical activity in 1967 applied to engineering, construction, and ground water projects
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1920	Drake	Love and Rayleigh waves in an irregular soil layer
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1932	Selvadurai	A theoretical assessment of the screw plate test
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1971	Crespellani	Numerical-statistical analysis of large-scale penetrometric tests
1972	Valisova	A mathematical and statistical evaluation of the methods for measuring the rheological and colloidal properties of a syntan-affected bentonite suspension
1993	Donald	The vane test; a critical appraisal
2031	Werner	Use of analytical and statistical techniques to assess in-situ soil test procedures
2066	Barbarick	Percolation tests for septic tank suitability in southern Arizona soils
2074	Nottingham	Use of quasi-static friction cone penetrometer data to predict load capacity of displacement piles
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2111	Wickham	Research in ground support and its evaluation for coordination with system analysis in rapid excavation
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2164	Baczynski	Application of various rock mass classifications to unsupported openings at Mount Isa, Queensland; a case study
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2085	Aufmuth	A systematic determination of engineering criteria for rock
2085	Avolio	A systematic determination of engineering criteria for rock

Rock Permeability

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2098	Casse	Effects of temperature and confining pressure on fluid flow properties of consolidated rocks
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2199	Crook	Some field permeation properties of fractured Permian and Triassic sandstones in northwest England
<u>File 89</u>		
1859	Gale	A numerical field and laboratory study of flow in rocks with deformable fractures
1877	Grafskiy	Efficiency of helium measurement in solving hydro-geological and engineering-geological problems
1907	Gangopadhyay	An approach to estimation of leakage from a karstic limestone reservoir
2048	Brown	Multivariate analysis of petrographic and chemical properties influencing porosity and permeability in selected carbonate aquifers in central Pennsylvania
2059	Boreli	Permeability tests for hydrodynamic simulation model of a rock mass in the foundation of a dam; case study of the Grancarevo Dam
2077	Bryant	Permeability of unconsolidated and consolidated marine sediments, Gulf of Mexico
2086	Benedini	A mathematical approach to the problem of water movement in fissured aquifers
2090	Rat	Measurement of permeability
2097	Alvarez	Permeability of rocky massifs; methods for measurement
2109	Witherspoon	A coupled stress-flow method of analyzing effects of fluiding action on stress distribution in fractured rocks
2109	Heeg	Simulation of liquid and gas flow in deformable porous rocks with reference to the deviation from Darcy's law
2110	Louis	The hydraulic characteristics of the foundation of the Grand-Maison Dam, Isere, France
2119	Snow	The statistical approach to fracture permeability
2126	Grice	Hydrogeology of the jointed dolomites, Grand Rapids hydroelectric power station, Manitoba, Canada

Rock Slope Stability and Pit Mines

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<u>File 6</u>		
2092	Piteau	Rock slope engineering reference manual
2133	Colorado School of Mines	A statistical study of rock slopes in jointed gneiss with reference to highway rock slope design
<u>File 8</u>		
2153	Glynn	Probability of kinematic instability in rock slopes--a numerical approach
2169	Deutsch	Stability analysis of rock slopes with respect to statistical aspects
2175	Baecher	Slope reliability models in pit optimization
2188	Young	Probability analysis of rock slopes and its application to a pit slope design
2192	Hoek	Rock slopes
2193	Martin	Select berm width to contain local failures
2194	Piteau	Slope stability analysis and design based on probability techniques at Cassiar Mine
2196	Crandall	Biaxial slip of a mass on a foundation subjected to earthquake motions
2200	McMahon	Probability of failure and expected volume of failure in high rock slopes
2206	Ko	Dynamic behavior of pit slopes in response to blasting and precipitation
2213	McMahon	Design of rock slopes against sliding on pre-existing fractures
2218	Pariseau	Rock mechanics and risk in open pit mining
<u>File 89</u>		
1815	Chen	Three-dimensional stability analysis
1861	Piteau	Slope stability analysis and design based on probability techniques at Cassiar Mine
1869	Richards	Analysis of slope stability at Goonvella Mine
1872	Kalkani	Comparison of zero-stress contours to surface erosion for excavated slopes in stratified rock
1898	Glynn	Probability of kinematic instability in rock slopes; a numerical approach
1907	Stepanov	Deformational stress state of mountain slopes and its change when creating huge reservoirs
1929	Sitar	Behavior of slopes in weakly cemented soils under static and dynamic loading
1941	Kawamoto	An analysis of progressive failure in rock slopes
1941	Deutsch	Stability analysis of rock slopes with respect to statistical aspects
1942	Maksimovic	Limit equilibrium for nonlinear failure envelop and arbitrary slip surface
1942	Hasegawa	A method slope stability analysis and design of slope by linear predictor
1980	Steffen	Some aspects of three-dimensional and two-dimensional rock slope stability analyses with two case histories
2015	Major	A general probabilistic analysis for three-dimensional wedge failures
2015	Marek	Probabilistic analysis of the plane shear failure mode
2016	Glass	Determining seismic risk for economic optimum slope design
2017	Berget	Analysis of discontinuity orientation for a probabilistic slope stability design
2024	Marion	Pit slope manual supplement 4-1; computer manual for seepage analysis
2025	Young	Probability analysis of rock slopes and its application to a pit slope design
2027	Piteau	Slope stability analysis and design based on probability techniques at Cassiar Mine
2041	Wang	Computer program for pit slope stability analysis by the finite element stress analysis and limiting equilibrium method
2071	St. John	Three-dimensional analysis of jointed rock slopes
2083	McMahon	Probability of failure and expected volume of failure in high rock slopes
2087	Makaldi	A statistical method for slope stability studies
2087	Largatelli	A geomechanical study of a rock slide at kilometer 193 between Tonale and Mendola on S.S.42, Trentino
2113	Yu	Analysis of rock slopes using the finite element method
2114	McMahon	A statistical method for the design of rock slopes
2130	Hammel	A mathematical model for pit slope stability, in operations research and computer applications in the mineral industries
2132	Hartman	A three-dimensional optimum pit program and a basis for a mining engineering system
2138	Piteau	Slope stability analysis and design based on probability techniques at Cassiar Mine
2139	Glynn	Probability of kinematic instability in rock slopes; a numerical approach
2139	Major	A general probabilistic analysis for three-dimensional wedge failures
2140	Marek	Probabilistic analysis of the plane shear failure mode
2240	Young	Probability analysis of rock slopes and its application to a pit slope design
2241	Piteau	Slope stability design and analysis based on mobility techniques at Cassiar Mine

Rock Strength, Stress and Deformation

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2108	Hawerick	Creep fracture in rock in uniaxial compression
2114	Norino	A method for estimating strength of rock containing planes of weakness
2115	Coulson	The effects of surface roughness on the shear strength of joints in rock
2129	VanDyke	Fracture of rock due to high pressure, short duration loadings
<u>File 8</u>		
2150	Dight	Prediction of shear behavior of joints using profiles
2154	Jong	Statistical prediction formula for compressive strength of a rock
2160	Wijk	Uniaxial strength of rock material
2167	Nishimatsu	On the probability distribution of failure life of rock under constant tensile stress
2179	Wijk	Relation between the uniaxial tensile strength and the sample size for Bohus Granite
2179	Cook	Variability and anisotropy of mechanical properties of the Pittsburgh Coal Seam
2186	Holcomb	Quantitative model of dilatancy in dry rock and its application to Westerly Granite
2186	Constantino	Statistical variation in stress-volumetric strain behavior of Westerly Granite
2197	Atkinson	Statistical variation of the compliance of coal
2199	Brown	Analysis of size effect behavior in brittle rock
2206	Mokhnachev	Tension fatigue of rocks
2206	Kaul	Effect of the volume of the specimen on the flexural strength of Makrana Marble
2207	Ramawamy	Factor of safety in rock mechanics
2209	Chappell	Component characteristics of jointed rock masses
2210	Medvedev	Statistical interpretation of the results of strength tests on rocks
2210	Stravrogin	Statistical principles of the strength and deformation of rock in complex states of stress
2211	Linde	How to anticipate deformation of rock bodies
2215	Stankus	How rock strength in the Kuzbass depends on geological and physical characteristics
2222	Lundborg	Statistical theory of the polyaxial compressive strength of materials
2223	Nishimatsu	Fatigue failure and fractography of rock under pulsating tensile stress
2223	Kostak	Pillar strength prediction from representative samples of hard rock
2224	Chan	Proposed method to obtain actual strength parameters of mine rocks and rock masses
2225	Yanaguchi	Number of test pieces required to determine the strength of rock
2225	Nishimatsu	Statistical distribution of fatigue life and the fracture mechanism of the rock
2226	Brady	Statistical theory of brittle fracture for rock materials
2227	Bergmann	Influence of random Poisson's ratio on displacements in elastic half-plane
2227	Sinha	Compressive strength of some Indian rocks
<u>File 58</u>		
2231	Constantino	Statistical variation in stress-volumetric strain behavior of granite
2232	Bishop	The values of Poisson's ratio in saturated soils and rocks stressed under undrained conditions
2232	Parrish	A non-linear least squares fitting approach for determining activation energies for high temperature creep
2232	Lundborg	A statistical theory of the polyaxial strength of materials
2236	Duval	Least squares calculation of horizontal stresses from more than three diametral deformations in vertical boreholes
<u>File 49</u>		
1823	Kalinin	Stress-deformation estimate of slopes in stratified sedimentary rocks
1828	Constantinescu	Study of depth influence on rock compressive strength
1829	Kinze	Deformation characteristics of broken schist in a rockfill dam
1833	Pande	Shakedown of elasto-plastic continua with special reference to soil-rock structures
1837	Pandurang	Physical, mechanical and strength properties of oil shale
1842	Dikovskiy	Analyzing errors in laboratory studies of rock strengths
1846	Kubritskiy	Probabilistic approach to deformation and strength properties of shale mass
1883	Nishimatsu	Simulation model of failure process of rock and its application to delayed failure
1882	Bunger	A numerical approach to predicting stresses and displacements around a three-dimensional pressurized fracture
1882	Nova	The failure of transversely isotropic rocks in triaxial compression
1887	Anderson	A finite element method for studying the transient non-linear creep of geological structures
1887	Ingraffea	Finite element models for rock fracture mechanics
1894	Stacey	A simple device for the direct shear-strength testing of intact rock
1898	Giannita	Comparison of finite element predictions of horizontal elastic rock movements to field measurements in an excavation in New York City
1899	Fittin	Numerical analysis of rock structures considering material nonlinearities
1902	Wang	A finite element simulation on the failure of brittle rocks
1903	Cheung	On the numerical solution of certain initial value problems
1903	Fan	On the application of an interpolation matrix for computation of stresses in finite elements
1906	Koch	Flow law of "wet" quartzite in the alpha-quartzite field
1906	Manson	Constitutive model for the low temperature creep of polycrystalline salt
1911	Stagg	On the application of a numerical visco-plastic model to rock mechanics problems
1915	Suzukawa	A study on core discing of rock
1915	Steffield	Discontinuity models of problems in geomechanics
1940	Lock	Variational approach for the elimination of temporary boundary effect from finite element method
1948	Barisau	A finite element approach to strain softening and size effects in rock mechanics
1948	Shu-fun	Nonlinear analysis of the mechanical properties of joint and weak intercalation in rock
1948	Dubois	Efficient three dimensional finite element analysis of stratified rocks
1949	Framer	Finite element analysis of stress distribution, induced fracture and post-failure behavior along a shear zone in rock
1956	Szavits	A relaxation stress-deformation finite element program
1957	Leary	A tractable constitutive relations and numerical procedures for structural analysis in masses of geological materials
1960	Pande	On joint interface elements and associated problems of numerical ill-conditioning
1965	Goodman	Finite element analysis for discontinuous rocks
1971	Yoganan	The applications of non-linear finite elements method in engineering geology
1975	Reyn	Creep, relaxation, and dynamic changes of stress in rocks
1976	Constantino	Statistical variation in stress-volumetric strain behavior of Westerly granite
1983	Nishimatsu	Computer modeling of rock fracture in uniaxial compression
1985	Gard	Evaluation of the anisotropic behavior of Brazilian test discs by the finite element method
1994	Murita	Stress analysis for a non-linear rock structure
2004	Hill, mb	A quantitative model of dilatancy on dry rock and its application to Westerly granite
2008	Goodman	Analysis in jointed rocks

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2009	Wilson	Finite elements for foundations, joints, and fluids
2014	Santich	Dynamic models of rock blasting
2016	Chong	Creep and relaxation of oil shale
2018	Glynn	A probabilistic model for shearing resistance of jointed rock
2040	Horino	A method for estimating strength of rock containing planes of weakness
2045	Kosloff	Treatment of hourglass patterns in low order finite element codes
2048	Burman	Development of a numerical model for discontinua
2049	Booker	Methods for the numerical solution of the equations of visco elasticity
2054	Atkinson	Statistical variation of the compliance of coal
2073	Von Thun	Deformation moduli determined by joints-shear index and shear catalogue
2074	Weber	The finite element method applied to fracture mechanics
2075	Kutter	Stress distribution on direct shear test samples
2076	Barton	A relationship between joint roughness and joint shear strength
2080	Spang	Numerical dynamic analysis of calcite deformation lamellae and calcite and dolomite twin lamellae
2088	Landberg	A statistical theory of the post yield strength of materials
2093	Chappel	Friction characteristic of graphite coated bedding joints in shale
2097	Bacar	Influence of the interstitial pressure under the conditions of resistance
2106	Glushko	Discussion of B. Kostak and H. W. Kienast's paper "strength distribution in hard rock"
2106	Aliev	Relationship between shear strength and vertical pressure in loessal rocks of the Tashkent region
2109	Canizo	Numerical analysis of an elasto-plastic rock medium
2127	Brady	A statistical theory for brittle fracture for rock materials; Part II, brittle failure under homogeneous triaxial states of stress
2127	Brady	A statistical theory for brittle fracture for rock materials; Part I, brittle failure under homogeneous axisymmetric states of stress
2128	Kolomoyskiy	The use of probability theory for the solution of some problems in engineering, geology
2128	Ivanova	Method of statistical approximation for determining the optimum size of engineering geological rock samples
2130	Brady	A statistical theory of brittle fracture for rock materials; Part 2, brittle failure under homogeneous triaxial states of stress
2130	Brady	A statistical theory of brittle fracture for rock materials; Part 1, brittle failure under homogeneous axisymmetric states of stress
2131	Dodds	Engineering geology of the Nez project, southwestern Iran
2132	Schubelager	Some implications of statistical transport theory in rock mechanics
2135	Schubelager	Some implications of statistical transport theory in rock mechanics
2145	Wane	The probabilistic nature of failure in the geologic universe
2148	Kozulilava	Probabilistic approach to deformation and strength properties of shale mass
224	Glynn	A probabilistic model for shearing resistance of jointed rock

Seepage, Soil Permeability, and Lifting

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2151	dewitt	Laboratory testing on lifting
2153	Maschineto	Mechanics of erosion in noncohesive soils
2161	Sposito	General criteria for the validity of the Buckingham-Darcy flow law
2221	Wu	Probabilistic analysis of seepage
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1817	Li	Free surface flow
1824	Darlow	Mixed finite element methods for miscible displacement problems in porous media
1831	Masilia	Evaluation of a Drainage Drain Design in an Earthfill Dam
1842	Lefebvre	Effectiveness of seepage control elements for embankments on semipermeable foundations
1851	Wells	Two-phase flow simulation of air storage in an aquifer
1854	Watts	Validation: an application of a statistical approach to filters and filter fabrics
1871	Smith	Spatial variability of flow parameters in a stratified sand
1886	Gray	Finite element technique for two-dimensional consolidation
1887	Bloomburg	Seepage from partially saturated mine waste disposal systems
1895	Dubinchuk	Isotope studies in hydrogeology and engineering geology
1904	Correia	The variable permeability method to finite element analysis of seepage in porous media
1909	Dehlin	Groundwater and drawdown in large earth excavation
1909	LaFleur	Groundwater regime associated with slope stability in Champlain clay deposits
1929	VanZyl	Seepage erosion of geotechnical structures subjected to confined flow: a probabilistic design approach
1929	Merilla	Seepage characteristics through an abandoned tail race pile
1936	Martinez	Free surface flow in porous media by finite element methods
1941	Gaff	Suitability of a seepage control element
1952	Sarda	Numerical modeling of seepage through and around dams
1953	Chung	Timespace finite elements for unsaturated flow through porous media
1953	Akai	Coupled stress flow analysis in saturated-unsaturated medium by finite element method
1953	Akai	Finite element analysis of three-dimensional flows in saturated-unsaturated soils
1967	Garza	Pore distribution and permeability of silty clays
1986	Dalen	Denitrification flow by finite elements
1993	Porokovskiy	Mathematical methods and the reliability of hydrogeological and engineering geology forecasting
1999	Farkas	Infiltration and laboratory permeability studies of spoils from selected coal strip mines, Lower River Basin, western and Montana
2008	Loeb	Interaction between water flow phenomena and the mechanical behavior of soil or rock masses
2040	Avall	Determining seepage characteristics of fill-stayings dams by the finite element method
2046	Deryushev	A mathematical model for predicting coupled heat and water movement in unsaturated soil
2144	Sardhu	Numerical performance of some finite element schemes for analysis of seepage in porous media
2061	Torelli	Random maze models of flow through porous media
2062	Liao	Statistical models of flow through porous media
2066	Kinell	Some comments on the association between saturated hydraulic conductivity and texture of clays
2066	Berberick	Percolation tests for septic tank suitability in southern Arizona soils
2101	Danivello	Statistical analysis of indices of physical consistency and permeability of loess in Iashant
2107	Lanlan	Internal erosion of compacted cohesive soil
2107	Evant	Permeability of unconsolidated and consolidated marine sediments, Gulf of Mexico
2107	Nator	Finite difference solution for drainage of heterogeneous sloping lands
2084	Shanz	Solution of a free-surface boundary value problem using an inverse formulation and the finite element method
2097	Wu	Probabilistic analysis of seepage
2097	Kelly	Probabilistic analysis of seepage (discussion)
2101	Tunay	Variations in the significance of soil and testing parameters on permeability at different stages of consolidation
2101	Schapper	A statistical network model and theory of porous media
2109	Zavdel	Statistical model of a porous medium; its application to the determination of electrical and hydrologic resistivities
2111	Wu	Probabilistic analysis of seepage
2112	Desai	Approximate solution for unconfined seepage
2114	Gheorghe	Sandy ground pore size distribution and its significance in drainage problems
2119	Perez - Rosales	Simultaneous determination of basic geometrical characteristics of porous media
2121	Snanbari	Analytical techniques for determining ground water flow fields
2131	McMillan	Theoretical analysis of groundwater basin operations

## Settlement and Heave

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2183	El-Moursi	Settlement prediction: a probabilistic approach
2175	Smith	Experimental sand drain study
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2182	Matsuo	Genetic design philosophy in settlement prediction
2188	Orvasak	Rate of flow and its effect on consolidation rates
2189	Sivandran	Application of probability theory to the finite element method in predicting settlements in soft Bangkok clay
2189	Asaka	Bayesian approach to inverse problem in consolidation and its application to settlement prediction
2171	Asaka	Settlement prediction of extensive reclaimed land
2171	Chang	Probabilistic approach to consolidation analysis
2184	El-Moursi	Estimate of soil compressibility from standard penetration test
2187	Orvasak	Consolidation: probabilistic approach
2187	Kogure	Statistical forecasting of compressibility of peaty ground
2143	Jordan	Settlement by sand methods by calculating and factors affecting
2143	Kogure	Probabilistic one-dimensional consolidation
2171	Samarski	Probabilistic prediction of lower settlements
2166	Arzoo	Regression analysis of soil compressibility
2116	Matsuo	Statistical approach to settlement prediction
2122	Erizek	Uncertainty of settlement analysis for overconsolidated clays
2126	Pollivan	Decision theory applied to settlement predictions
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2129	Koppala	Statistical estimation of Compression Index
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1815	Pitt	Deformation restraint and the mechanics of soil behavior
1817	Vermeer	Consolidation
1828	Balaam	Settlement analysis of soft clays reinforced with granular piles
1842	Koppala	Statistical estimation of compression index
1842	Donatton	Finite element consolidation analyses of tunnel behavior in clay
1875	Swang	A probabilistic consolidation analysis for embankment foundations
1875	Orszmanaki	Stresses and displacements in a layered subsoil finite element analysis: Part 2, finite element assembly for a layered subsoil
1884	Szeznizak	Application of isotope techniques to the assessment of the consolidation effect on the structure of peats
1911	Yuan	Primary and secondary plane strain consolidation problems by the finite element method
1903	Sandhu	Analysis of consolidation of viscoelastic soils
1915	Linno	Settlement under circular loading for construction of tank foundation
1919	Sivandran	Probabilistic analysis of stability and settlement of structures on soft Bangkok Clay
1916	Sivandran	Application of probability theory to the finite element method in predicting settlements in soft Bangkok Clay
1954	Sparks	Numerical methods for the settlement of Venice and layered soil deposits
1954	Small	Analysis of the consolidation of layered soils using the method of lines
1954	Sagaseta	Numerical model for undrained and consolidation deformations of soft clays
1955	Richter	Nonlinear consolidation models for finite element computations
1955	Desai	A one-dimensional finite element procedure for nonlinear consolidation
1955	Aubry	Special algorithms for elastoplastic consolidation with finite elements
1964	Christian	Two- and three-dimensional consolidation
1964	Schiffman	One-dimensional consolidation
1979	Aka	Numerical analysis of stress path under multidimensional consolidation
1979	El-Moursi	Uncertainty analysis of settlement rate
1986	Ramaswamy	Settlement of footings on compacted clays
1990	Sanglerat	Surcharge fill settlements on soft clay at the location of two air cooling towers
1992	Schultze	Statistical evaluation of settlement observations
1994	Johnson	A finite element method for consolidation of clay
2029	Kogure	Statistical forecasting of compressibility of peaty ground
2048	Martin	A three dimensional deformation analysis of the Storvaas Dam
2050	Desai	Consolidation analysis of layered anisotropic foundations
2071	Cornell	First-order uncertainty analysis of soils deformation and stability
2075	El-Moursi	Probabilistic approach to one-dimensional consolidation settlement
2077	Simons	Finite element analysis of the surface deformation due to uniform loading on a layer of Gibson soil resting on a smooth, rigid base
2130	Tunay	Variations in the significance of soil and testing parameters on permeability at different stages of consolidation
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Site Investigation Planning

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2212	Vick	Probabilistic approach to geologic investigations for hard-rock tunnels
2217	Wu	Uncertainty, safety and decision in soil engineering
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2229	Wu	Probabilistic soil exploration case history
2230	Phosphorous Potassium	Investigation of Egypt's Abu Tartur phosphate deposit
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1824	Vasil'yev	Optimizing the volume of drilling work while completing deposit exploration
1850	Prasada	Sedimentology, geochemistry and discriminant analysis in the engineering geological investigation of dam-sites, lower Gordon area, Tasmania
1886	Perisic	Contribution to the rationalization of drilling pattern for research of low grade coal by geostatistical method
1889	Crespellani	Use of factor analysis in geotechnical exploration of the subsurface
1918	Davis	Better exploration decisions with probability analysis
1975	Ratz	Statistical theory of sampling nonuniform soils
2025	Einstein	Decision analysis applied to rock tunnel exploration
2088	Vick	A probabilistic approach to geologic investigations for hard-rock tunnels
2099	Gorokhovskiy	Some problems of methodology in applying statistical methods in engineering-geological investigations
2108	Bolstad	Procedures used for sampling fracture orientations in an underground coal mine
2125	Bondarik	Application of sequential analysis in engineering-geologic sampling
2241	Vick	A probabilistic approach to geologic investigations for hard-rock tunnels

Slurry Trench Walls

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2052	Rosenberg	Design, construction and performance of a slurry trench wall next to foundations

Soil Fabric

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2201	Jowitt	Influence of void distribution and entropy on the engineering properties of granular media
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1884	Rzezniczak	Application of isotope techniques to the assessment of the consolidation effect on the structure of peats
2102	McConnachie	Fabric changes in consolidated kaolin
2130	Pusch	Quick-clay microstructure
2135	Marsal	Stochastic processes in the grain skeleton of soils

**Soil Slopes, Embankments, Dams and Excavations**

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2197	Ramov	The behavior of statistically heterogeneous excavated earth slopes
2198	Kraft	The behavior of statistically heterogeneous excavated earth slopes
2125	Smith	Experimental sand drain study
2139	Sallberg	Study of embankment settlement and stability
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2149	Grivas	Slope safety prediction under static and seismic loads
2149	Chapuis	New stability method for embankments on clay foundations
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2152	Araoka	Short-term reliability of slopes under static and seismic conditions
2154	Grivas	Reliability approach to the design of soil slopes
2155	Knight	Measurement, trial use and selection of initial design parameters for dikes on very soft clay in the Dead Sea, Jordan
2156	Chugh	Multiplicity of numerical solutions for slope stability problems
2157	Choudhury	Probabilistic evaluation of natural slope failure
2163	Malasubramanian	Stability and settlement of embankments on soft Bangkok clay
2168	Vannierke	Probabilistic stability analysis of earth slopes
2169	Grivas	Seismic analysis of slopes in the northeast U.S.A.
216	Grivas	Probabilistic seismic stability analysis - a case study
2168	Matsu	Design method of deep excavation on cohesive soil based on the reliability theory
2170	Schilke	Slope stability and the bearing capacity of shallow foundations on slopes
2170	Papadimitriou	Information theory approach to slope stability
2170	Arvan	On the probability of failure of slopes
2170	Marsou	Prediction of slope slide by probability of failure
2171	Suvaratnaswat	Margin of safety for slope stability
2175	Isler	Reliability of earth slopes
2178	Raymond	Sea-load Ballast load ranking classification
2181	Kraft	Probabilistic analysis of excavated earth slopes
2181	Smith	Stochastic seismic stability prediction of earth dams
2182	Schmitter	Safety analysis of an earth dam on probabilistic basis
2185	Tezzareno	Reliability analysis of slopes: frequency-domain method
218	Yong	Application of risk analysis to the prediction of slope instability
2181	Nambu	Stability analysis of banks for roads by statistical methods
2184	Skarlatos	Stability of slopes in variational and probabilistic solutions
2184	Reider	Probabilistic assessment of the stability of a cut slope
2185	Yong	Application of risk analysis to prediction of slope instability
2186	Albuz	Risk analysis of slopes and its application to slopes in Canadian sensitive clays
2186	Greenhill	Rotational slip of a mass on a foundation subjected to earthquake motions
2191	McGard	On the reliability of flood levee systems
2200	Vannierke	Probabilistic prediction levee settlements
2200	Marsou	Uncertainties and decision in design of embankment
2203	Grivas	Stochastic propagation of rupture surfaces within slopes
2203	Yang	Reliability-based short term design of soil slopes
2204	Yong	Influence of the variability of coarse grained materials properties on the stability of earth dams
2205	Yong	Earth slope reliability by a level crossing method
2209	Wu	Stability of embankment on clay
2210	Wu	Stability analysis of stability of slopes
2210	Wu	Safety analysis of slopes
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2217	Li	Free surface flow and stress analysis of earth dams
2217	Wesell	Numerical models for three soil structures
2221	Tagaris	Stability method for embankments on clay foundations
2228	Wynn	Sediment characteristics of Alpine Mudflows, Nigel Pass, 1946
2231	Christakos	Analysis of a progressive failure in Pannonian clay
2231	Burland	Movements and flow conditions in London clay
2231	Chapuis	Lateral earth pressure due to surcharge loads
2232	Prasad	A general mathematical model for clay core stability tests
2232	Prasad	Influence of core filling procedure upon shear stress embankment tests
2232	Prasad	Core of loose soil in the field: a case study in Texas for an embankment test of stability
2232	Chapuis	Stability analysis of a submerged slope with horizontal stress distribution
2236	Kohert	Remarks on the validity of stability analyses
2240	Kalilay	The design of dikes and embankments on the finite element method of stress analysis
2241	Chapuis	Evolution of the extent of movement of a clay mass
2241	Malasubramanian	Stability and settlement of embankments on soft Bangkok clay
2241	Al-Anwar	Probabilistic partial safety factor design for slopes on clays with $\phi = 0$ soils
2242	Grivas	Probabilistic seismic stability analysis of embankment
2242	Smith	On the water and soil flow in a slope stability problem
2242	Chapuis	On the water and soil flow in a slope stability problem
2243	Marsou	A design method for embankment stability on clay foundations
2243	Keating	Stability of embankments on clay foundations
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2247	Wesell	Relationships between soil strength, settlement, and slope stability: a case study in the Netherlands
2247	Wesell	The global failure mechanism in a slope stability problem
2247	Wesell	Stability of embankments on clay foundations
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1984	Chang	Analysis of consolidation of earth and rockfill dams; Appendices C-E; user's manual for computer program CON2D for the finite element analysis of consolidation in zoned dams
1990	Chirapontu	Cracking and progressive failure of embankments on soft clay foundations
1990	Brenner	Geotechnical aspects of soft clays
1992	Dolezalova	Stability of a deep excavation bottom
1994	Anton	INPEP's views on earthquake-resistant design of earth dams
2007	Biernatowski	Stability of slopes in variational and probabilistic solutions
2010	Wroth	The predicted performance of soft clay under a trial embankment loading based on the Cam-clay model
2015	Mans	Finite element analyses of deep excavation behavior in soft clay
2021	Akay	Earthquake analysis of Keban Dam
2032	Okamoto	Study of effects on a berm on the stability on rockfill dams during earthquakes
2040	Corp	Elastic-plastic stability analysis of mine-waste embankments
2041	Wang	Computer program for pit slope stability analysis by the finite element stress analysis and limiting equilibrium method
2043	Rodriguez	The development and application of a finite element program for the solution of geotechnical problems
2044	Wang	Slope stability analysis by the finite element stress analysis and limit equilibrium method
2046	Martin	A three-dimensional deformation analysis of the Starvass Dam
2047	Tang	Probability-based short term design of soil slopes
2047	Resendiz	The short-term stability of open excavations in Mexico City clay
2048	Osaimi	Finite element analysis of time dependent deformations and pore pressures in excavations and embankments
2050	Keger	Mass movement on spoil outcrops of contour surface-mines, North-central West Virginia
2052	Bryce	Effective stress finite element slope analysis
2057	Kienzel	Investigation and stability analysis of earth slopes
2071	Cornell	First-order uncertainty analysis of slope deformation and stability
2077	DeSilva	Slope stability problems induced by human modification of the soil covered hill slopes of Oahu, Hawaii
2081	Rouse	Engineering properties and slope form in granular soils
2081	Lumb	Probabilistic aspects of slope stability
2084	Perman	Predicted deformation of the upstream membrane of a rockfill dam
2085	Chang	Calculation of deformation on earth dams
2085	Chang	Stress-strain analysis of earth and rockfill dams
2087	Magee	A statistical method for slope stability studies
2090	Ritch	A factor of safety approach for evaluating seismic stability of slopes
2094	Fremont	Limit analysis by finite element methods
2096	Smith	Finite element analysis of entrapped and built up pore stability and earth pressures
2098	Lee	Stability and earth pressures
2105	Menzies	Stress analysis and slope stability in strain softening materials
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1917	Kawasaki	Seismic reponse analysis of composite ground treated by deep chemical mixing stabilization method; Pa : 1, Analytical Method
2042	Tan	Finite element analysis and design of chemically stabilized tunnels

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2141	Herbst	Shear phenomena in granular random packings
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2175	Kitamura	Mechanism of deformation of particulate materials as Markov process
2184	Grivas	Variability of soil strength and its consequences on the reliability of structures on ground
2190	Mitsuo	Probability models of undrained strength of marine clay layer
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2198	Panastotopoulos	Variational inequality approach to the stochastic friction boundary value problem and application in soil mechanics
2200	Kolinski	Probabilistic limit analysis of plates on plastic subgrade
2201	Lippmann	Extremum and variational principles in plasticity
2203	Cambou	Applications of first-order uncertainty analysis in the finite elements method in linear elasticity
2214	Bazant	Micromechanics model for creep of anisotropic clay
2218	Feda	Creep of soils
2222	Lundborg	Statistical theory of the polyaxial compressive strength of materials
2224	Wilkins	Theory for the shear strength of rockfill
2224	Lumb	Safety factors and the probability distribution of soil strength
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1817	Vardoulakis	Trap-door problem with dry sand; a statistical approach based upon model test kinematics
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1829	Franke	Design parameters for soft clays
1835	Tobita	Stress-strain relationship of sand and its application to FEM analysis
1835	Koenders	Numerical and analytical computations of excess pore pressures
1835	Ansal	Endochronic models for soils
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1836	Chahoussi	Modeling and analysis of cyclic behavior of sands
1836	Buyce	A non-linear model for the elastic behavior of granular materials under repeated loading
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1837	Prevost	Finite element solution of boundary value problems in soil mechanics
1845	Christian	Discussion of "state of the art: laboratory strength testing of soils"
1845	Prevost	Nonlinear anisotropic stress-strain behavior of soils
1875	Cryczmanaki	Stresses and displacements in a layered subsoil: finite element analysis; Part 2, finite element assembly for a layered subsoil
1876	El-Shafee	Dynamic axisymmetric soil model for a flexible ring footing
1878	Molenkamp	A continuum model on the basis of the double sliding, dilatative, free rotating model
1891	Toh	Finite element analyses of isotropic and anisotropic cohesive soils with a view to correctly predicting impending collapse
1902	Gudehus	A comparison of some constitutive laws for soils under radially symmetric loading and unloading
1912	Muroto	An experimental program to define the yield function for sand
1912	Cavounidis	Parametric elastoplastic analysis of clay fills
1913	Yasuki	A stress-strain relationship of normally consolidated cohesive soil under general stress condition
1920	Karahanas	Modeling and finite element analysis of soil behavior
1923	Wroth	The predicted performance of soft clay under a trial embankment loading based on the Cam-clay model
1923	Sugano	Moduli of elasticity of soils and their application to deformation analysis of soil structures
1925	Richards	A method of analysis of the effects of volume change in unsaturated expansive clays on engineering structures
1939	Bugrov	Numerical methods in calculations of stressed-strained states and consolidation of earth structures and foundations
1949	Orta	Constitutive equations considering anisotropy and stress reorientation in clay
1950	Chambon	Incremental nonlinear stress-strain relationship for soil and integration by finite element method
1950	Prevost	Mathematical modeling of soil stress-strain-strength behavior
1950	Martins	A survey of the methods to calculate safety against collapse in soil and rock masses
1951	Gudehus	A constitutive law of the rate type for soil
1951	Cundall	The development of constitutive laws for soil using the distinct element method
1951	Aubry	Numerical algorithms for an elastoplastic constitutive equation with two yield surfaces
1956	Ray	Three-dimensional continuous-finite element formulation for dynamic impedance evaluation of arbitrarily shaped foundations
1957	Phan	Three-dimensional geometric and material nonlinearities analysis of some problems in geomechanics
1959	Al-Shawaf	Variable modulus model for inelastic finite element analysis
1960	Ginda	Elastic-plastic analysis of geotechnical problems by mathematical programming
1966	Zienkiewicz	Viscoplasticity; a generalized model for description of soil behavior
1970	Monnet	Determination of a law for the shearing behavior of non-cohesive soils; application to the calculation of triaxial tests
1972	Vallero	A mathematical and statistical evaluation of the methods for measuring the rheological and colloidal properties of a synton-affectated bentonite suspension

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1973	Scheffler	Determination of stress-strain behavior in unconsolidated rocks as a prerequisite for the application of the finite element method
1977	Wroth	Finite element computations using an elastoplastic soil model for geotechnical problems of soft clay
1979	Simpson	A computer model for the behavior of London clay
1985	Lade	Prediction of undrained behavior of sand
1987	Vallabhan	Finite element analysis of the behavior of dilatant soils
1987	Richards	Application of an experimentally based nonlinear constitutive model of soils in laboratory and field tests
1987	Helenelund	Methods for reducing undrained shear strength of soft clay
1991	Kasim	A numerical solution for the stresses and deformations in a pseudo-plastic soil system
1991	Boulon	Incremental rheological law for soils and applications by the finite element method
1992	Williams	The in situ shear behavior of fissured soils
1998	Nelson	Constitutive models for use in numerical computations
2000	Bondarenko	Statistic modeling of the stages of creep processes
2009	Verruljt	Generation and dissipation of pore water pressures
2010	Wroth	The predicted performance of soft clay under a trial embankment loading based on the Cam-clay model
2010	Zienkiewicz	Some useful forms of isotropic yield surfaces for soil and rock mechanics
2010	Zienkiewicz	A unified approach to soil mechanics problems including plasticity and visco-plasticity
2011	Haddad	A multivariable-statistical approach to the evaluation of the undrained behavior of clays
2013	Yanada	Large strain analysis of some geomechanics problems by the finite element method
2021	Naumovski	Earthquake response of continuous media using dynamic relaxation
2030	Sukiye	Stresses and strains in non-linear viscous soils
2044	Hsu	Analysis of soil deformation by elastic-plastic work-hardening model
2045	Banerjee	Associated and non-associated constitutive relations for undrained behavior of isotropic soft clays
2047	Richards	Theoretical transient behavior of saturated and unsaturated soils under load and changing moisture conditions
2049	Booker	Methods for the numerical solution of the equations of viscoelasticity
2050	Carter	Finite deformation of an elasto-plastic soil
2053	Williams	The behavior of clays containing pre-existing discontinuities
2060	Vallappan	Application of finite element method to soil deformation
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2124	Lumb	Safety factors and the probability distribution of soil strength
2125	Alpan	Effective and true strength in normally-consolidated clays; some statistical considerations
2128	Marsal	Large scale testing of rockfill materials
2131	Houper	Some numerical results concerning the shear strength of London clay
2136	Sallberg	Shear strength
2137	Holmes	The prediction of strength in the sediments of St. Andrew Bay, Florida

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1826	Khalvati	Dynamic soil structure interaction effective stress analysis
1847	Medina	Modeling of soil-structure interaction by finite and infinite elements
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1878	Gupta	Hybrid modelling of soil-structure interaction
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1888	Kagawa	Soil-pile-structure interaction of offshore structures during an earthquake
1890	Nuti	Dynamic soil-structure interaction in a pile of a bridge on pile foundations
1893	Kunar	A model with non-reflecting boundaries for use in explicit soil-structure interaction analyses
1901	Roesset	Nonlinear effects in dynamic soil structure interaction
1933	Barla	Finite element analysis of soil-pipeline interaction
1937	Popovic	Numerical analysis of soil-structure interaction for a special case of heterogeneity
1941	Arochiasamy	Comparison of finite element and lumped parameter modeling for seismic response of reactor building foundation systems
1961	Dezfulian	Finite element analysis of seismic soil-structure interaction effects for nuclear power plants
1978	Lysmer	Finite element computer programs for seismic soil-structure interaction-analysis
1986	Rowe	Application of the initial stress method to soil-structure interaction
1996	Werkle	Determination of spring constants in SSI by a finite element method
1996	Holzloehner	Dynamic soil-structure interaction
1997	Altes	Influence of embedment of a reactor building on the seismic behavior
1997	Kausel	Deterministic and probabilistic soil-structure interaction analysis by finite elements; workshop discussion on J. Lysmer's main lecture
1997	Born	Numerical analysis of dynamic rock-structure interaction
1999	Pandya	Seismic soil-structure interaction by finite elements case studies
2009	Smith	Some time-dependent soil-structure interaction problems
2009	Desai	Soil-structure interaction and simulation problems
2034	Ukaji	Elastic-plastic dynamic analysis of soil-foundation-structure interaction
2035	Kamil	Soil-pile-structure-field interaction under seismic loads
2035	Wight	Soil-structure interaction in nuclear power plants; a comparison of methods
2035	Gutierrez	Evaluation of methods for earthquake analysis of structure-soil interaction
2047	Gutierrez	A substructure method for earthquake analysis of structures including soil structure interaction
2048	Fraser	A rational analysis of shallow foundations considering soil-structure interaction
2050	Hall	Soil-structure interaction for nuclear power plants
2117	Duncan	Finite element analyses of Port Allen Lock

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2194	Smirnov	Representativeness of physical and mechanical characteristics of rocks surrounding coal seams, and methods of estimating them
2207	Javoraki	Correlation analysis in petrophysics
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2214	Friedman	Investigations of the relations among residual strain, fabric, fracture and ultrasonic attenuation and velocity in rocks
2214	Selavin	Relationships between some physical properties of rock determined by laboratory tests
2215	Stankus	How rock strength in the Kuzbass depends on geological and physical characteristics
2219	Haralick	Computer classification of reservoir sandstones
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2234	Kuznetsov	Attaining statistical reliability in models of random properties on a continuous media
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1852	Mashkour	Strength-index tests of rocks from Iraq
1855	Ihara	A study of roadway closure
1855	Yoshinaka	Physical and mechanical properties of soft rocks and its bearing capacity
1856	Sture	Multiaxial testing to determine material behavior for design of energy related structures
1858	Marechal	The practice of mining geostatistics in 1980
1860	Panek	Estimating mine pillar strength from compression tests
1860	Wittke	Interpretation of the results of a rock mechanical test program for a powerhouse cavern by means of numerical analyses
1866	Hayne	Mathematical-statistical relations between rock mechanics and petrophysical parameters
1871	Koithara	Statistical analysis of density and porosity of subsurface rock samples from Denver Basin
1875	Pantartzis	Engineering geology problems with the planned development of the Nestos River in Northern Greece
1877	Grafakis	Efficiency of helium measurement in solving hydrogeological and engineering-geological problems
1882	Olhoeff	Physical property statistics and geologic noise
1883	Idz	Determination of a friction angle for an alkaline igneous rock
1886	Von Fambusch	Recent movement in the northern Upper Rhine Graben: integration of geodetic, geologic and soil mechanics data
1887	Hvers	Meso-scale relationships of talus and insolation, San Juan Mountains, Colorado
1889	Korostovshevskii	Evaluation of the coefficient of porosity in a multi-layered producing section at the exploratory stage
1892	Avonnan	Petrophysics of sedimentary rocks under conditions of great depth
1892	West	Grain size analysis and petrographic examination of a gravel deposit relative to engineering quality, W. Lafayette, Indiana
1895	Siska	Study of the stability of the underlying bed in the Sokolov lignite district (Czechoslovakia) taking the bit springs into account
1905	Agayev	The classification of rocks using physico-mechanical properties
1906	Warren	Rock physics characterization of Conway granite from a DOE borehole, Conway, N.H.
1908	Barroca	Geomechanical characteristics of a granite body at a damsite
1922	Foeker	General geotechnical considerations and finite element analysis in the planning of dam foundations
1922	Denis	Rock identification by means of continuity index
1928	Giusho	Engineering-geological features of iron deposits
1928	Maxant	Variation of density with rock type, depth, and formation in the Western Canada Basin from density logs
1938	Helwick	Prediction of the geotechnical properties of late Quaternary Mississippi Delta deposits
1959	Tierman	Characterization and similarity testing of the mechanical properties of rocks
1974	Groth	FEM-analysis compared to model studies
1980	Lackey	An analysis of rock properties and geological discontinuities on pillars roadway stability
1985	Olhoeff	Tables of room temperature electrical properties for selected rocks and minerals with dielectric permittivity statistics
1993	Rogers	The effect of de-icing agents on water adsorption phenomena in rock aggregates
1994	Voigt	Rock stress investigations and the tectonics of Iceland
2003	Hudec	Rock weathering on the molecular level
2003	Hortino	Mechanical properties of cores obtained from the unleached saline zone, Florence Creek Basin, Rio Rio de Janeiro, Colorado
2004	Harvey	Absorption and other properties of carbonate rock affecting soundness of aggregate
2006	Munoz	Schmidt hardness versus mechanical properties in rock samples; statistical correlation
2022	Giushko	A method of selecting the distribution law mode during statistical analysis of physical-mechanical properties of rocks
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2027	Sorenson	Statistical analysis of laboratory compressive strength and Young's modulus data for the design of production pillars in coal mines
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2081	Paul	Distribution analysis of soil-physical characteristics for engineering geological purposes
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2119	Bondarik	The problem of determining rock properties, based on the theory of variability
2120	Chick	Use of MDC method-Polish variety of PERI method in engineering-geologic programming
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2175	Idem	Statistical study of soil mechanical properties of natural soil and systems
2176	Idem	Statistical study of soil mechanical properties of natural soil and systems
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2081	Rouse	Engineering properties and slope form in granular soils
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2180	Ida	Three dimensional analysis of stress and strain in rock
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189	Wizalawa	Static analysis for underground openings in jointed rock
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189	Reagan	Comparative studies of hollow space construction based on numerical calculations
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2091	Ashby	Derivation of parameters necessary for the evaluation of performance of sites for deep geological repositories
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1822	Johnson	Seismic resistance capacity evaluation of existing spent nuclear fuel storage racks
1838	Brandshaud	Thermomechanical assessment of compensated CAES caverns in hard rock
1839	Osnes	Parametric thermal/thermoelastic analyses of nuclear waste repositories in granite and other non-salt rock types
1841	Harrington	Time-dependent closure analysis of a nuclear waste repository in bedded salt
1852	Doctor	The use of geostatistics in high level radioactive waste repository site characterization
1856	Mucciardi	Statistical investigation of the mechanics controlling radionuclide sorption; Part II
1857	Chan	Thermal and thermomechanical data from in-situ heater experiments at Stripa, Sweden
1866	Garling	Finite element analysis of thermal convection in deep ocean sediments
1868	D'Alessandro	Radioactive waste disposal into Boom Clay Formation; probabilistic assessment of the geological containment
1875	Wagner	Parametric study involving thermo/viscoelastic analyses of a room and pillar configuration
1880	Thoms	Monitoring current rates of salt dome movement
1883	Albrecht	Rock mechanical aspects of final storage radioactive waste in salt domes with emphasis on the flow of rock salt
1894	Serne	Preliminary results on comparison of adsorption-desorption methods and statistical techniques to generate Kd predictor equations
1911	Strensdoeter	Analysis of the elastoplastic behavior of gas storage cavities in salt deposits by finite element method
1916	Petrie	Use of a computer model in the safety assessment of buried nuclear waste repositories at a hypothetical site in the Columbia Plateau Basalts
1940	Hilber	Transient response of fractured rock systems to fluid injection; a finite element study
1944	Komada	Numerical method on underground containment of fission products at a hypothetical accident in underground nuclear power plant
1946	Fuh	Annular rock caverns for energy storage under Fourier expendable stress fields
1959	Neuzil	Fracture leakage in Cretaceous shales and its significance for underground waste disposal
1986	Frind	Application of unsaturated flow properties in the design of geologic environments for radioactive waste storage facilities
2026	Thoms	Site specific studies for possible ongoing salt dome movement
2026	Mahlab	Stability of a radioactive waste repository in the Canadian Shield
2064	Gralla	Criteria and importance of gas storage in German oil and gas deposits
2065	Bentschea	Structure of the salt of the Etzel salt dome derived from cores and logs
2121	Bardwell	Some statistical features of the relationship between Rocky Mountain Arsenal waste disposal and frequency of earthquakes
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Analysis of Variance

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2130	Smith	Investigation into the uses of statistical procedures in specification writing and quality control
2130	Jorgenson	The statistical approach to quality control in highway construction. Phase I, measuring the variability. Part A, compacted embankment
2133	Utah State Department of Highways	The repeatability of test result using various California bearing ratio procedures and the resistance R-value
2137	Sherman	Control of cement in cement treated base
2140	Williamson	An investigation of compaction variability for selected highway projects in Indiana

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2169	Asaoka	Bayesian approach to inverse problem in consolidation and its application to settlement prediction
2198	Veneziano	Bayesian design of optimal experiments for the estima- tion of soil properties
2205	Matsuo	Statistical study on a conventional safety factor method
2226	Folayan	Decision theory applied to settlement predictions
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1853	Schoof	Problems and pitfalls of using Bayesian models for seismic hazard analysis
1976	Mortgat	A Bayesian model for seismic hazard mapping
2019	Gulkan	A seismic risk study of Izmir
2043	Gray	Bayesian decision analysis of a statistical rainfall/ runoff relation
2055	Mortgat	A Bayesian approach to seismic hazard mapping; development of stable design parameters
2071	Tang	A Bayesian evaluation of information for foundation engineering design

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2093	Johnson	Predicting potential heave and heave with time in swelling foundation soils
2094	Van Zyl	Storage, retrieval and statistical analysis of Indiana shale data
2096	Meyer	Trafficability classification of Thailand soils
2100	Dillon	The influence of soil and rock properties on the dimensions of explosion - produced craters
2104	Torrey	Analysis of field compaction data. Report 2: Litteville Dam, Westfield River, Massachusetts
2106	Bryant	Statistical relationships between geotechnical properties of Gulf of Mexico sediments
2107	Freitab	Tracks versus wheels in soft soil and snow
2110	Judd	Strain distribution around underground openings. Statistical relationships for certain rock properties
2111	Wickham	Research in ground support and its evaluation for coordination with system analysis in rapid excavation
2112	Strebig	Effect of organic additives of impregnated diamond drilling
2113	Judd	Strain distribution around underground openings. Comparison between predicted and measured displacements
2115	Coulson	The effects of surface roughness on the shear strength of joints in rocks
2123	Nahas	Strain distribution around underground openings. Statistical methods to compile and correlate rock properties - computer techniques
2128	Judd	Strain distribution around underground openings. Statistical methods to compile and correlate rock properties and preliminary results
2133	Colorado School of Mines	A statistical study of rock slopes in jointed gneiss with reference to highway rock slope design. Volume II Appendices
2134	Louisiana Department of Highways	Correlation of rapid hydrometer analysis for select material to existing procedure LDH-TR-407-66
<u>File 8</u>		
2149	Chapuis	New stability method for embankments on clay foundations
2149	Davis	Energy dissipation and seismic liquefaction in sands
2151	García-Bengochea	Use of pore size distribution parameters to predict permeability
2154	Dienes	On the influence of crack statistics from observations on an outcropping
2154	Joak	Statistical prediction formula for compressive strength of a rock
2155	Knight	Measurement, trial use and selection of initial design parameters for dikes on very soft clay in the dead sea, Jordan
2156	Bolya	Statistical dimensioning of slurry trench walls
2156	Bland	Confidence in the failure envelope
2160	Bondurant	Statistical analysis and modeling of the physical, mechanical, and strength properties of oil shale
2168	Hudson	Discontinuities and rock mass geometry
2168	Sheinin	Computation and analysis of probabilistic characteristics of stresses near underground opening in stochastically inhomogeneous rock mass
2172	Athanasiou-Grivas	Joint distribution of the components of soil strength
2174	Balasubramaniam	Statistical evaluations of the strength characteristics of Bangkok clay
2175	labba	Statistical analysis of geotechnical records
2184	El-Moursi	Estimate of soil compressibility from standard penetration
2188	Baecher	Statistical description of rock properties and sampling
2195	Gawad	Standard penetration resistance in cohesionless soils
2211	Taylor	English and Welsh colliery spoil heaps - mineralogical and mechanical interrelationships
2211	Galai	Correlations between plasticity indices of clays
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2229	Koppula	Statistical estimation of compression index
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1861	Linder	Correlation of lithofacies and soil mechanic properties of the Holocene coastal sediment of the southern North Sea with multivariate statistical methods
2006	Munoz	Schmidt hardness versus mechanical properties in rock samples; statistical correlation
2067	Chakhvadze	Statistical correlation of grain size and consistency classes of loess in the uratube area
2069	Schultze	Frequency distributions and correlations of soil properties
2082	Bell	Comparison of relative densities estimated using different approaches
2092	Scholl	Low-rise building damage from low-amplitude ground motions
2096	Anderson	Statistical correlation of physical properties and sound velocity in sediments
2100	Skinner	Rock property correlation, Crescent Mine, Idaho
2100	Jumay	Variations in the significance of soil and testing parameters on permeability at different stages of consolidation
2107	Scholl	Statistical correlation of observed ground motion with low-rise building damage
2119	Fil'shtinskiy	Application of correlation and regression analysis of the study of the relationship among elastic wave velocity, density, and carbonate properties of rock
2124	Bardwell	Some statistical features of the relationship between Rock Mountain Arsenal waste disposal and frequency of earthquakes
2126	Mutmansky	A statistical study of relationships between rock properties
2137	Judd	Correlation of rock properties by statistical methods

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1909	Blom	Spectral reflections and discrimination of plutonic rocks in the 0.45-to-2.45 mu M region
1960	Reger	Discriminant analysis as a possible tool in landslide investigations
2004	Fisher	Prediction of shoreline erosion trends from synoptic beach surveys, Rhode Island Coast
2012	Anonymous	Earth Resources Program; development of a computer-aided procedure for the National Programs of inspection of dams
2054	Denness	Engineering evaluation of seabed sediment by cluster analysis

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2174	Balasubramaniam	"Statistical evaluations of the strength characteristics of Bangkok clay"
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1908	Barrocu	Geomechanical characteristics of a granit body at a dam site
1919	Sivandran	Probabilistic analysis of stability and settlement of structures on soft Bangkok clay
2011	McWilliams	Multivariate analysis techniques with applications in mining
2061	Kolomenskiy	The utilization of engineering experiments in the analysis of the principal components of various rocks
2104	Wiatr	Application of factor analysis to classification of engineering-geological environments
2125	Mutmansky	A statistical study of relationships between rock properties
2126	Mutmansky	A statistical study of relationships between rock properties
2126	Zodrow	The magnetite distribution in the Smallwood mine
2130	Brady	A statistical theory of brittle fracture for rock materials
2131	Shahbazi	Analytical techniques for determining groundwater flow fields

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2162	Hewitt	Measurement and comparison of soil structures
2173	Grigoriu	Extremes of moving average processes
2175	Kitamura	Mechanism of deformation of particulate material as Markov process
2198	Holtz	Statistical evaluation of soils test data - 2. Factor analysis
2175	Kitamura	Mechanism of deformation of particulate materials as Markov process
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1972	Pegram	Some simple expressions for the probability of failure of a finite reservoir with Markovian input
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2061	Fiering	Reservoir planning and operation

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2095	Davis	A short-term study of beach sand movement adjacent to Monterey Canyon
2100	Dillow	The influence of soil and rock properties on the dimensions of explosion-produced craters
2102	Starnitser	Formation of elastoplastic deformations of soil under impact compression
2111	Kennedy	Trafficability of soils. Supplement No. 18; development of revised mobility index formula for self-propelled wheeled vehicles in fine-grained soils
2116	Hoag	Estimation of the original shear strength of deep sea sediments from engineering index properties
2141	Liu	A comparison of clay contents determined by hydrometer and pipette methods using reduced major axis analysis
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2151	Haupt	Prediction of subgrade moisture conditions
2159	Ola	Relation between CBR and 'static' modulus of deformation of stabilized lateritic soils
2160	Bondurant	Statistical analysis and modeling of the physical, mechanical, and strength properties of oil shale
2164	Iritunac	Dependence of the Fourier amplitude spectra of strong motion acceleration on the depth of sedimentary deposits
2174	Kramer	Applicability of regression analysis to investigate the influence on the carrying capacity of ground anchors
2177	Blum	Probabilistic procedures for peak ground motions
2178	Raymond	Railroad ballast load ranking classification
2185	Chamberlain	Resilient response of two frozen and thawed soils
2189	Brenner	Measurement and prediction of vibrations generated by drop hammer piling in Bangkok subsoils
2190	Kogure	Statistical forecasting of compressibility of peaty ground
2191	Marcuse	SPT and relative density in coarse sands
2199	Rizkallah	Applicability of regression analysis in soil mechanics with the help of data-banks
2203	Tang	Probability-based short term design of soil slopes
2204	Azzouz	Regression analysis of soil compressibility
2206	Kay	Sheetpile interlock tension - probabilistic design
2207	Jaworski	Analiza Korelacynna W Petrofizyce (correlation analysis in petrophysics)
2210	Chernyak	Determination of rock displacements at the periphery of preparatory workings affected by mining-out work
2221	Summers	Water jet cutting of sedimentary rock
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2224	Hasefer	Some multivariate probabilistic techniques in geotechnical engineering
2229	Lindner	Lithofacies correlation and soil-mechanical properties of coastal Holocene sediments from the southern North Sea with multivariate statistical methods
2232	Parrish	A non-linear least square fitting approach for determining activation energies for high temperature creep
2233	Komariv	Multivariate statistical analysis in engineering geology
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1817	Bondurant	Statistical analysis and modeling of the physical mechanical, and strength properties of oil shale
1841	Sridharan	Prediction of frequency and amplitude of foundations at resonance
1842	Islami	Seismic aspects of Jaleghon Dam
1858	Marechal	The practice of mining geostatistics in 1980
1860	Panek	Estimating mine pillar strength from compression tests
1866	Hevne	Mathematical-statistical relations between rock mechanic and petrophysical parameters
1880	Lachapelle	Empirical determination of the gravity anomaly covariance function in mountainous areas
1886	Von Fahnbusch	Recent movement in the northern Upper Rhine Graben; integration of geodetic, geologic and soil mechanics data
1886	Hevne	Dependence of rock density on chemical oxide contents and ultrasonic velocities
1896	Livneh	Using indicative properties to predict the density-moisture relationship of soils
1897	Romanova	Research in mathematical geology
1915	Duwall	Least squares calculation of horizontal stresses from more than three diametral deformations in vertical boreholes
1918	Calle	Determination of earth pressures on sheet pile walls from measures of deflections and bending moments
1924	O'Brien	The correlation of response spectral amplitudes with seismic intensity
1982	Waldo	An approach to seismic zoning in southern New England
1994	Morita	Regression analysis and error evaluation for parameter determination in petroleum engineering problems; error sensitivity analysis for search parameters and predicted performance
2004	Harvey	Absorption and other properties of carbonate rock affecting soundness of aggregate
2011	McWilliams	Multivariate analysis techniques with application in mining
2012	Das Gupta	Comparison of lithologic and structural controls on fracturing in carbonate rocks
2014	Milligan	Grouping of marine sediments using a multivariate analysis of seismic profiles
2015	Cruden	Simple graphical methods for estimating the confidence region about the orientation of the intersection of two planes
2029	Rasemann	Mathematical problems in geology
2029	Rasemann	Variance analysis and its application for geological purposes
2040	Kaebel	Experiences with mathematical-geological methods in engineering-geological works
2043	Andrews	Statistical zonation as an aid to geotechnical evaluation of oceanic sediments
2048	Brown	Multivariate analysis of petrographic and chemical properties influencing porosity and permeability in selected carbonate aquifers in central Pennsylvania
2050	Woodfork	Univariate and multivariate statistical analysis of West Virginia landslide data
2055	Dimitrijev	Results of the application of correlation and regression analyses to the determination of factors influencing the reworking of the shores of the Volograd water reservoir
2065	Irfunac	Preliminary empirical model for scaling Fourier amplitude spectra of strong ground acceleration in terms of earthquake magnitude, source-to-station distance, and recording site conditions
2095	Iyengar	Probability of failure of structures under earthquake excitations
2100	Iunay	Variations in the significance of soil and testing parameters on permeability at different stages of consolidation
2110	Sato	Determination of the center of the distribution of collapsed houses
2119	Fil'shtinskiy	Application of correlation and regression analysis of the study of the relationship among elastic wave velocity, density, and carbonate properties of rocks
2121	Bardwell	Some statistical features of the relationship between Rocky Mountain Arsenal waste disposal and frequency of earthquakes
2123	Ege	Stability index for underground structures in granitic rock
2123	Ruddock	Properties and position in lateritic, some statistical relationships
2124	Bardwell	Some statistical features of the relationship between Rocky Mountain Arsenal waste disposal and frequency of earthquakes
2129	Perez-Rosales	Simultaneous determination of basic geometrical characteristics of porous media
2130	Hammel	A mathematical model for pit slope stability
2130	Lumb	The variability of natural soils
2131	McMillan	Theoretical analysis of groundwater basin operations



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2129	Wu	Stability of embankment on clay
2131	Wates	Stability of pillar failure at Hill of Iap
2131	Vick	Probabilistic approach to geologic investigations for hard-rock tunnels
2131	Miyawara	Probability of earthquake occurrence estimated from results of rock fracture experiments
2131	Nees	Probabilistic analysis and design of a retaining wall
2131	Wu	Probabilistic analysis seepage
2131	Krzek	Uncertainty of settlement analysis for overconsolidated clays
2131	Lundberg	Statistical theory of the polyaxial compressive strength of materials
2131	Nakano	Statistical method for analysis of diffusion in soils
2131	Yano	Safety factors and the probability distribution of soil strength
2136	Polivanov	Decision theory applied to settlement predictions
2137	Wu	Safety analysis of slopes
2137	Baranovskii	Influence of random Poisson's ratio on displacements in elastic half-plane
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2137	Fairley	Statistical analysis of sand liquefaction
2137	Wu	Probabilistic soil exploration case history
2137	Kuroda	Probabilistic modeling of uncertainties in sampling and testing for undrained strength
2137	Remick	Rational coefficient design in geotechnics
2137	Yano	Probabilistic evaluation of penetration resistance
2137	Athanasios-Ntrivas	Probabilistic evaluation of safety of soil structures
2137	Yakovlev	Statistical theory of fragmentation
2137	Leves	A statistical estimation of flood flows
2137	Mikheev	Analysis of large-panel buildings on statistically heterogeneous foundation beds
2137	Yakovlev	A statistical theory of the polyaxial strength of materials
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1857	S. Shami	Probabilistic earthquake expectancy in the northeast Indian region
1857	Fairley	Probabilistic analysis of deposit liquefaction
1857	Leves	Slope stability analysis and design based on probabilistic techniques at Cassiar mine
1857	Miles	Seismic zoning in Canada, some modifications to current maps
1857	Algermissen	New probabilistic hazard maps for the U. S., a progress report
1857	Schneidman	Late quaternary faulting as a guide to regional variations in long-term rates of seismic activity
1857	Chameau	Probabilistic and hazard analysis for pore pressure increase in soils due to seismic loading
1857	Yano	Probabilistic evaluation of loads
1857	Leves	Probability of earthquake occurrence in the vicinity of the Chena flood control dam near Fairbanks, Alaska
1857	McIntire	Effects of temporal variations in seismicity on seismic hazard
1857	Geological Institute	Scenarios of possible earthquakes affecting major California population centers, with estimates of intensity and ground shaking
1857	Savoostrianista	Using a computer program for probabilistic finite element analysis of seismic soil-structure interaction
1857	Yakovlev	Estimating the probability of occurrences of surface faulting earthquakes on the Wasatch Fault zone, Utah
1857	Yakovlev	Fracture densities in the Kettlelake Mountain field, Wyoming
1857	Yakovlev	Probabilistic partial safety factor design techniques for undrained soil stability problems
1857	Yakovlev	Probabilistic stability analysis of earth slopes
1857	Leves	Better exploration decisions with probability analysis
1857	Yakovlev	Probabilistic estimates of maximum seismic horizontal ground motion on rock in the Pacific Northwest and the adjacent inter-continental shelf
1857	Sivandran	Probabilistic analysis of stability and settlement of structures on soft Bangkok clay
1857	Sivandran	The probabilistic evaluation system of earthquake spectra
1857	McIntire	Probabilistic procedures for assessing soil liquefaction potential
1857	Yakovlev	Seepage or flow of geotechnical structures subjected to confined flow, a probabilistic design approach
1857	Yakovlev	Landslides from the Feb. 2, 1976 Guatemala earthquake, implications for seismic hazard reduction in the Guatemala city area
1857	Sivandran	Application of probability theory to the finite element method in predicting settlements in soft Bangkok clay
1857	Sivandran	Computation and analysis of probabilistic characteristics of stresses near underground opening in stochastically inhomogeneous rock mass
1861	Jang	Probabilistic evaluation of penetration resistances
1861	Blume	Probabilistic procedures for peak ground motions
1861	Blume	Probabilistic evaluation of the design basis seismic ground motion (DBSGM) for Chats Falls site
1861	Athanasios-Ntrivas	Probabilistic evaluation of safety of soil structures
1870	Weichert	On Canadian methodologies of probabilistic seismic risk estimation
1870	Hart	Mechanics of particulate media, a probabilistic approach
1891	Schulze	Speciality Session B, the probabilistic approach to soil mechanics design
1897	Kausel	Deterministic and probabilistic soil structure interaction analysis by finite elements, workshop discussion on L. Iversen's main lecture
2007	Biernatowski	Stability of slopes in variational and probabilistic solutions
2015	Majer	A general probabilistic analysis for three-dimensional wedge failures
2015	Marek	Probabilistic analysis of the plane shear failure mode
2016	Glynn	A probabilistic model for shearing resistance of jointed rock
2017	Herget	Analysis of discontinuity orientation for a probabilistic slope stability design
2020	Ahorner	Probability distribution of earthquake accelerations for sites in western Germany
2030	Crouse	Probabilistic evaluation of liquefaction with an application to a site near a subduction zone
2038	Yoshikawa	A probabilistic approach to estimate design earthquake for a site in terms of magnitude, epicentral distance and return period
2051	Mayer-Rosa	Seismic risk maps of Switzerland, description of the probabilistic method and discussion of some input parameters
2051	Ahorner	Probability distribution of earthquake accelerations for sites in western Germany
2051	Willmore	The UK approach to hazard assessment
2051	Slunga	Probability model for peak ground accelerations, in Sweden
2055	Kiremidjian	Probabilistic hazard mapping; development of site dependent seismic load parameters
2057	Haluar	Probabilistic evaluation of liquefaction of sand under earthquake motions
2069	Nelson	A probabilistic approach to the correction of soil strength
2071	Costello	Probability and economical foundations
2075	El-Moursi	Probabilistic approach to one-dimensional consolidation settlement
2078	Mirtskhoulava	Prognosis of some general deformation of natural and artificial alluvial beds composed of non-uniform material
2078	Bulkley	Probability models of wastewater treatment plant operation
2080	Mirtskhoulava	Investigation and forecast of sediment motion from position of reliability and probability theories
2083	Lumb	Probabilistic aspects of slope stability
2084	Flaxagea	Use of territorial analysis of hydrologic sequences to determine probabilities of various hydrologic parameters
2088	Vick	A probabilistic approach to geologic investigations for hard rock tunnels
2091	Sutabutr	The approximate probability density function of range and adjusted range
2097	Wu	Probabilistic analysis of seepage
2097	Kelly	Probabilistic analysis of seepage (discussion)
2105	Chou	Hazard exposure
2117	Ishihara	Probability of levee breaks due to heavy rainfalls in a river
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2130	Hammel	A mathematical model for pit slope stability

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2092	Bidwell	Risks and costs for ocean structures
2092	Hein	Effects of earthquake on system performance of water lifelines, seismic design decision analysis
2111	Wickham	Research in ground support and its evaluation for coordination with system analysis in rapid excavation
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2155	Balasubramanian	Performance of friction piles in Bangkok subsoils
2158	Athanasios-Grivas	Reliability approach to the design of geotechnical systems
2160	Haldrup	Liquefaction study - a decision analysis framework
2167	Athanasios-Grivas	Reliability of retaining structures during earthquakes
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2173	Grivas	Reliability analysis of retaining structures
2173	Madhav	Pile capacity - a reliability approach
2181	Bell	Design earthquake motions based on geologic evidence
2181	Veneziano	Reliability analysis of slopes - frequency-domain method
2180	Yong	Application of risk analysis to the prediction of slope instability
2182	Hoek	Rock slopes
2182	Outinhat	Study of attenuation parameters for California
2184	Birman	Slope stability analysis and design based on probability techniques at various risk
2185	Yong	Application of risk analysis to prediction of slope instability
2185	Pender	Probabilistic assessment of the stability of a cut slope
2186	Alonso	Risk analysis of slopes and its application to slopes in Canadian sensitive clay
2187	Eisenberg	Safety of seismic protective systems with reserve elements
2188	Schulze	Applications of Statistics and Probability in Soil and Structural Engineering and Literature Survey of Proceedings, 1975
2200	McMahon	Probability of failure and expected volume of failure in high rock slopes
2202	Bozaidi	On the reliability of flood levee systems
2203	Ambo	Applications of first order uncertainty analysis to the finite elements method in soil engineering
2205	Matsuo	Statistical study on a conventional "safety factor method"
2206	Ko	Dynamic behavior of pit slopes in response to blasting and precipitation
2209	Wu	Stability of embankment on clay
2212	Coates	Probability of pillar failure at Elliot Lake
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2217	Wu	Uncertainty, safety, and decision in soil engineering
2218	Parisseau	Rock mechanics and risk in open pit mining
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1828	Howland	A simplified procedure for reliability analysis in geotechnical engineering
1829	Simons	Statistics, reliability theory and safety factors
1829	Hoek	Statistics, reliability theory and safety factors
1904	D'Andrea	Probabilistic partial safety factor design techniques for undrained soil stability problems
1920	Lomnitz	Canadian methodologies of probabilistic seismic risk estimation discussion and reply
1930	Harr	Reliability and the factor of safety due to piping
1930	Anderson	Application of seismic risk analysis to problems in microzonation
1931	Patwardhan	Location for critical facilities based on two-level earthquakes
1933	Cronee	The prediction of the performance of flexible pavements using stress analysis techniques
1934	Michiam	Analytical model for drilled shaft foundations
1935	Randolph	The effect of pile permeability on the stress changes around a pile driven into clay
1938	Hanza	The design of footings on cohesionless soil
1945	Gartung	Viscoplastic finite element analysis of tunnel sections in grouted sand
1948	Parisseau	A finite element approach to strain softening and size effects in rock mechanics
1949	Cramer	Finite element analysis of stress distribution, induced fracture and post-failure behavior along a shear zone in rock
1963	Smith	Numerical and physical modeling
1977	Pegram	Some simple expressions for the probability of failure of a finite reservoir with Markovian input
1979	El-Moursi	Uncertainty analysis of settlement rate
1980	Fadeev	Elastoplastic analysis of stresses in coal pillars by finite element method
1982	Baath	Seismic risk in Fennoscandia
1998	Nelson	Numerical solution of problems involving explosive loadings
1999	Ferritto	Evaluation of probability of seismic liquefaction
2005	David	Numerical approximations in pile-driving analysis
2006	Munoz	Schmidt hardness versus mechanical properties in rock samples: statistical correlation
2007	Dolezalova	Underground opening and deformation in jointed rock
2016	Glaes	Determining seismic risk for economic optimum slope design
2018	Gupta	Stochastic time series analysis of volcanic events in Central Luzon, Philippines
2018	Omote	A new approach for estimating earthquake risk
2020	Grassias	Migration of destructive earthquakes in Middle America and associated risk of occurrence
2021	Akay	Earthquake analysis of Keban Dam
2021	Smith	Statistical estimates of the likelihood of earthquake shaking throughout New Zealand
2027	Aherner	Probability distribution of earthquake accelerations with applications to sites in the Northern Rhine Area, Central Europe
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2036	Hair	An approach to establishing design surface displacements for active faults

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2016	Basu	Seismic risk analysis of Indian Peninsula
2017	Alonso	Seismic risk and seismic zoning of the Caracas Valley
2017	Shah	A seismic risk contour map for Nicaragua
2017	Whitman	Seismic design regionalization maps for the U. S.
2017	Faccioli	Probabilistic assessment of seismic risk on local soil sediments
2050	Reger	Mass movement on spoil outcrops of contour surface-mines, North-Central West Virginia
2051	Millmore	The UK approach to hazard assessment
2051	Slunga	Probability model for peak ground accelerations in Sweden
2053	Labbe	Microseismic relations for the seismic risk evaluation in Chile
2055	Mortgat	A Bayesian approach to seismic hazard mapping; development of stable design parameters
2057	Hattori	The regional distribution of the earthquake danger in Japan
2061	Blume	Civil structures and earthquake safety
2064	Derkiureghian	A line-source model for seismic risk analysis
2068	Singh	How reliable is the factor of safety in foundation engineering
2070	Iang	Reliability analysis and design of braced excavation systems
2071	Lytton	Risk design of stiffened mats on clay
2071	Cornell	First-order uncertainty analysis of soils deformation and stability
2080	Iaccarino	Seismic risk in Italy for earthquakes of intensity IX
2086	Ang	Probability concepts in earthquake engineering
2090	Roth	A factor of safety approach for evaluating seismic stability of slopes
2091	Esteve	Geology and probability in the assessment of seismic risk
2092	Caputo	Analysis of seismic risk
2100	Lundquist	Rock structure design by failure probabilities
2105	Nenzies	Stress analysis and slope stability in strain-softening materials
2106	Howell	Average regional seismic hazard index (ARSHI)
2111	Shah	Forecasting the risk inherent in earthquake resistant design
2117	Kedar	Earthquake risk mapping
2119	Lumb	Probability of failure in earthworks
2120	Woo	A statistical study of the maximum ground motion in strong earthquakes
2142	Wane	The probabilistic nature of failure in the geologic universe

Simulation

<u>Page No.</u>	<u>Main Author</u>	<u>Title</u>
<u>File 6</u>		
2097	Smith	Pressure and gravity effects on the simulation of meteorite impact craters
2113	Palmer	Settlement of a pipeline on thawing permafrost
<u>File 8</u>		
2153	Grivas	Reliability approach to the design of soil slopes
2153	Michalopoulos	Measurement, selection and use of dynamic soil properties in design
2158	Grivas	Reliability approach to the design of geotechnical systems
2193	Freeze	Probabilistic one-dimensional consolidation
2198	Panagiotopoulos	Variational inequality approach to the stochastic friction boundary value problem and application in soil mechanics
2202	Panagiotopoulos	Stochastic calculation of foundations with elastic unilateral and friction boundary conditions
2202	Wagner	Statistical optimization of friction pile foundations
2206	Kay	Sheet pile interlock tension - probabilistic design
2208	Pariseau	Influence of rock properties variability on mine opening stability analysis
2218	Pariseau	Rock mechanics and risk in open pit mining
<u>File 89</u>		
1905	Anthanasiou-Grivas	Probabilistic seismic stability analysis; a case study
1975	Ratz	Statistical theory of sampling nonuniform soils
2015	Major	A general probabilistic analysis for three dimensional wedge failures
2015	Marek	Probabilistic analysis of the plane shear failure mode
2024	Sedlacek	A stochastic model for the description of the breakdown of a packet bed system by material exchange
2054	Atkinson	Statistical variation of the compliance of coal
2078	Slack	On the value of information to flood frequency analysis
2115	Muspratt	Numerical statistics in engineering geology

Stochastic Techniques

<u>Page No.</u>	<u>Main Author</u>	<u>Title</u>
<u>File 6</u>		
2090	Baecher	Geotechnical reliability of offshore gravity platforms
2092	Bidwell	Risks and costs for ocean structures
2093	Dienes	Statistical theory of fragmentation
2094	Gilbert	A probabilistic analysis of embankment stability problems
2103	Biaz-Padilla	Settlement prediction: a probabilistic approach
2113	Palmer	Settlement of a pipeline on thawing permafrost
<u>File 8</u>		
2150	Fardis	Probabilistic analysis of deposit liquefaction
2152	Foerster	Influences on the probability of failures of slopes
2155	Valalas	Soil/structure interaction and soils heterogeneity
2158	Fardis	Statistical analysis of sand liquefaction
2159	La Pointe	Analysis of the spatial variation in rock mass properties through geostatistics
2163	Busch	Stochastic model of the creep of soils
2166	Vanmarcke	Probabilistic stability analysis of earth slopes
2167	Nishimatsu	On the probability distribution of failure life of rock under constant tensile forces
2168	Sheinin	Computation and analysis of probabilistic characteristics of stress near underground opening in stochastically inhomogeneous rock mass
2169	Asaoka	Bayesian approach to inverse problem in consolidation and its application to settlement prediction
2171	Stoyan	On the probability of failure of slopes
2173	Grigoriu	Extremes of moving average processes
2175	Iabba	Statistical analysis of geotechnical records
2182	Singh	Stochastic seismic stability predictions of earth dams
2184	Jodrey	Simulation of random packing of spheres
2185	Veneziano	Reliability analysis of slopes: frequency domain method
2187	Fardis	Seismic soil-containment interaction: pipe safety
2191	Shinozuka	Underground pipe damages and ground characteristics
2191	Vanmarcke	Probabilistic modeling of soil profiles
2192	Gurpinar	Study of attenuation parameters for California
2195	Sadasivan	Theory for shear strength of granular materials
2196	Crandall	Biaxial slip of a mass on a foundation subjected to earthquake motions
2198	Panayiotopoulos	Variational inequality approach to stochastic friction boundary value problems and applications in soil mechanics
2198	Veneziano	Bayesian design of optimal experiments for the estimation of soil properties
2200	Dolinski	Probabilistic limit analysis of plates on plastic subgrade
2201	Vanmarcke	Probabilistic prediction of levee settlements
2202	Panayiotopoulos	Stochastic calculation of foundations with elastic unilateral and friction boundary conditions
2203	Anthanasίου-Grivas	Stochastic propagation of rupture surfaces within slopes
2205	Catalan	Earth slope reliability by a levee-crossing method
2218	Feda	Creep of soils
2221	Matsuo	Stochastic study on some properties and failure probability for unsaturated soils
2223	Nakano	Statistical method for analysis of diffusion in soils
<u>File 58</u>		
2229	Hasofer	Some multivariate probabilistic techniques in geotechnical engineering
2229	Fardis	Statistical analysis of sand liquefaction
<u>File 89</u>		
1815	Kavvas	Stochastic trigger model for flood peaks; 1, development of the model
1815	Kavvas	Stochastic trigger model for flood peaks; 2, application of the model to the flood peaks of Goksu-Karabacili
1945	Levtsin	Statistical approach to problems in the classification of rock complexes
1945	Sheinin	Computation and analysis of probabilistic characteristics of stresses near underground opening in stochastically inhomogeneous rock mass
2014	Tugal	Acoustic identification of marine sediments by stochastic methods
2018	Gupta	Stochastic time-series analysis of volcanic events in Central Luzon, Philippines
2024	Sedlacek	A stochastic model for the description of the breakdown of a packet bed system by material exchange
2030	Singh	A stochastic method for seismic stability evaluation of earth structures with strain dependent properties
2056	Kuchan	Calculation of recurrence and intensity of landslide processes
2065	Faccioli	A stochastic approach to soil amplification
2068	Koerner	Application of stochastic processes to partially saturated soils
2068	Donevan	A stochastic approach to the seismic liquefaction problem
2074	Lou	Stochastic simulation of earthquakes
2080	Bilico	Stochastic structure of the turbulent boundary shear stress process
2080	Ravaziti	Stochastic methods for motion of suspended grains
2094	Lomnitz	Global tectonics and earthquake risk
2113	Coates	The effect of stress concentrations on the stability of tunnels
2135	Marsal	Stochastic processes in the grain skeleton of soils

Time Series Analysis

Page No.	Main Author	Title
<u>File 8</u>		
2154	Spanos	Statistics of structural responses to seismic waves filtered through rock and soil formations
2158	Gazetas	Random vibration analysis for the seismic response of earth dams
2161	de Herrera	Analysis of liquefaction potential based on probabilistic ground motions
2164	Trifunac	Dependence of the Fourier amplitude spectra of strong motion acceleration on the depth of sedimentary deposits
2166	McAnally	Ultimate load foundation design using statistically based factors
2167	Tomizawa	Identification of a one-dimensional model for a soil-layer-bedrock system during an earthquake
2174	Christian	Probabilistic soil dynamics: state-of-the-art
2176	Kiremidjian	Probabilistic site-dependent response spectra
2177	Savy	Nonstationary risk model with geophysical input
2178	Cornell	Seismic motion and response prediction alternatives
2180	Kubo	Simulation of three-dimensional strong ground motions along principal axes, San Fernando earthquake
2181	Kubo	Analysis of three-dimensional strong ground motions along principal axes, San Fernando earthquake
2182	Singh	Stochastic seismic stability prediction of earth dams
2182	Dendrou	Uncertainty finite element dynamic analysis
2184	Wu	Statistical representation of joint roughness
2187	Fardis	Seismic soil-containment interaction: pipe safety
2187	Romstad	Site dependent earthquake motions
2189	McGuire	Seismic ground motion parameter relations
2189	Romo-Organista	Finite element random vibration method for soil-structure interaction analysis
2190	Lin	Criteria for the generation of spectra consistent time histories
2191	Shinozuka	Underground pipe damages and ground characteristics
2192	Kiremidjian	Probabilistic site-dependent response spectra
2192	Anderson	Uniform risk absolute acceleration spectra
2192	Gurpinar	Study of attenuation parameters for California
2197	Zaslavsky	Comparison of bedrock and surface seismic input for nuclear power plants
2197	Eisenberg	Safety of seismic protective systems with reserve elements
2209	Yamshchikov	Creation of a methodology for making measurements in solid rock
2227	Liu	Spectral simulation and earthquake site properties
<u>File 58</u>		
2230	Khanna	Site dependent spectra for a seismic design
<u>File 89</u>		
1871	Smith	Spatial variability of flow parameters in a stratified sand
1920	Riznichenko	The Lashkent-California system of earthquake spectra
1924	Crouse	Probability of earthquake ground accelerations in San Diego
1963	Desai	Numerical methods in geotechnical engineering
1966	Desai	Numerical methods in geotechnical engineering
1966	Jurkevics	Autoregressive parameters for a suite of strong motion accelerograms
1983	Hasegawa	Seismotectonics of the Beaufort Sea
1996	Ohaski	Statistical analysis of strong motion acceleration records
2012	Sadigh	Design response spectra for moderate magnitude local earthquakes at rock and stiff-soil sites
2012	Anonymous	Earth resources program; development of a computer-aided procedure for the national program of inspection of dams
2018	Gupta	Stochastic time-series analysis of volcanic events in Central Luzon, Philippines
2020	Dezfulian	Finite element grids for dynamic response analysis
2035	Wight	Soil-structure interaction in nuclear power plants; a comparison of methods
2090	Donovan	Statistical uncertainty of design based on smoothed response spectra
2134	Lacer	A simulation of earthquake amplification spectra for southern California sites
2134	Herrera	Earthquake spectrum prediction for the Valley of Mexico
2135	Herrera	Response spectra on stratified soil

APPENDIX C: NTIS (FILE 6)

### Probabilistic Evaluation of Damage Potential in Earthquake-Induced Liquefaction in A 3-D Soil Deposit

Georgia Inst. of Tech., Atlanta, School of Civil Engineering \*National Science Foundation, Washington, DC. (010263012)

#### Technical rept.

AUTHOR: Haldar, Achintya; Miller, Frank J.  
G707102 Fld 8K, 8M, 500 GRA18217

Mar 82 146p

Rept No SCERG-101-82

Grant NSF-PFR80-06348

Monitor NSF/CEE-82003

**Abstract:** A probabilistic model is proposed to evaluate the risk of liquefaction at a site and to limit or eliminate damage during earthquake-induced liquefaction. The model is extended to consider three-dimensional nonhomogeneous soil properties. Literature is surveyed to identify the parameters relevant to the liquefaction phenomenon, including (1) soil parameters; (2) parameters required to consider laboratory test and sampling effects; and (3) loading parameters. The fundamentals of risk-based design concepts pertinent to liquefaction are reviewed. A detailed statistical evaluation of the soil parameters in the proposed liquefaction model is provided and the uncertainty associated with the estimation of in situ relative density is evaluated for both direct and indirect methods. In the evaluation of the liquefaction potential of a site, it was found that the uncertainties in the load parameters could be higher than those in the resistance parameters.

**Descriptors:** \*Earthquakes. \*Soil mechanics. Soil properties. Probability density functions. Damage assessment. Loads (Forces). Mathematical models.

**Identifiers:** \*Liquefaction (Soils). \*Risk analysis. Seismic risk. NTISNSRCEE

PB82-202276 NTIS Prices: PC A07/MF A01

### Fracture Analysis of Crystalline Rocks: Field Measurements and Field Geomechanical Techniques

Institute of Geological Sciences, Harwell (England). Environmental Protection Unit. (075040001)

AUTHOR: McEwen, P. J.

G6773C4 Fld: 8G, 500 GRA18214

1980 78p

Rept No: ENPU-80-11

**Abstract:** The natural fractures occurring in crystalline rocks are described in terms of their occurrence in granite masses and in metamorphic rocks. Their orientations are shown to be

related to the palaeo or present stresses which acted on the rocks. To the tectonic setting of the rock mass, and in some cases to any igneous banding that might exist. The analysis of fractures in surface outcrops and in boreholes is discussed in detail, and it is shown how estimates of fracture length, fracture area and fracture interconnectivity can be made from relatively simple measurements. The biases inevitably incurred during sampling are discussed in terms of their influence on the analyzed data, and methods for compensating for their effects are also included. The influence of the fracture surfaces on the mechanical properties of rock masses is described, and methods for measuring the shear strengths of fracture surfaces is discussed. The importance of the shear strength of rocks is analyzed in terms of their effects on determining the development of the fracture system. Finally the use of fracture orientations to determine the geotectonic stress field is discussed with examples from different tectonic environments.

**Descriptors:** \*Granite. \*Rock mechanics. Metamorphic rocks. Stresses. Fracture properties. Joints (Junctions). Deformation. Spacing. Probability density functions. Boreholes. Statistical analysis. Shear strength. Bins. Tunneling (Excavation)

**Identifiers:** \*Foreign technology. NTISDFMBR. NTISFNUK

PB82-176678 NTIS Prices: PC A05/MF A01

**Investigation of Compaction Criteria for Airport Pavement Subgrade Soils**

Army Engineer Waterways Experiment Station, Vicksburg, MS.  
Geotechnical Lab. Federal Aviation Administration, Washington, DC.  
Systems Research and Development Service. (L2262107  
411412)

Final rept. Mar 78-Apr 81  
AUTHOR Brabston, William N  
G6134H2 Fld 8M, 1E, 50R, 500 GRA18208  
Oct 81 1740  
Rept No WES/TR/GL-81-11  
Contract D01-FA78WAF-876  
Monitor FAA/RD-81/48

**Abstract** A study was conducted to determine the effect of lowering soil density requirements for subgrades under airport pavements. The investigation was primarily a laboratory effort in which molded specimens of three different soil types, compacted to densities at and below those currently specified by FAA criteria, were subjected to repeated axial loadings in a triaxial compression chamber. The primary response parameters of interest were permanent and resilient axial strain. Test results were formulated into a statistical model to predict permanent soil strain based on soil characteristics such as density, clay content, compaction characteristics, and shear strength. The strain model was used to calculate values for permanent soil deformation at the surface of the subgrade for various combinations of soil density. Results of the test indicated that the wide variation in soil response among the three materials tested precluded any general alteration in current FAA compaction criteria. (Author)

Descriptors: Pavement bases. Soil mechanics. Runways. Soil dynamics. Compacting. Laboratory tests. Soil stabilization. Density. Deformation. Loads (Forces). Strain (Mechanics). Resilience. Structural response. Clay. Sand. Flexible structures. Statistical analysis. Rigidity. Moisture. Models. Airports

Identifiers: Axial strain. Subgrade soils. NTIS0001XA  
NTIS001FAA  
AD-A108 51R/2 NTIS Prices. PC A08/MF A01

**Limit State Design in Geotechnical Engineering**

Cambridge Univ. (England). Dept of Engineering (G0-5285015)  
AUTHOR Bolton, M D  
G5603G1 Fld 13M, 8M, 890, 500 GRA18202  
1981 35p  
Rept No. CUFD/D-SOILS/TR-103-1981  
Also pub. as ISSN-0309-7439.

**Abstract:** Contents. Development of design procedure. Limit

States in geotechnical engineering: Uncertainty: Interpreting geotechnical data: Permeability: Compressibility: Undrained strength: Angle of shearing resistance: Water pressures: Selecting limit state modes: and limit state envelopes.

Descriptors: Limit design method. Soil mechanics. Probabilty theory. Construction

Identifiers: Foreign technology. Geotechnical engineering. Limit states. NTISFCUOF. NTISFNUK

F82-113440 NTIS Prices. PC A03/MF A01

**Geotechnical Reliability of Offshore Gravity Platforms**

Massachusetts Inst of Tech. Cambridge Sea Grant Coll.  
Program National Oceanic and Atmospheric Administration.  
Rockville, MD. Office of Sea Grant (0014450233)  
AUTHOR Baehmi, Gregory R.; Chan, Mark; Ingra, Thomas S.; Leo, Thomas; Mueli, Louis R.  
G492764 Fld 13J, 8M, 47, 50R, 86M GRA18122

Dec 80 298p  
Rept No MITS-80-20  
Grant NOAA O4-7-158 44079  
Monitor NOAA 81-42708

**Abstract** The main part of the report is organized into five broad chapters. The first presents an overview of the sources of geotechnical uncertainty in offshore structures, previous quantitative analysis of those uncertainties, and the philosophy of formal methods in geotechnical reliability analysis. The second and third examine the basic uncertain variables, dealing with environmental loads and load effects, and with site characterization and parameter estimates, respectively. Chapter 5 is an extended discussion of the problem of modeling foundation performance, and the uncertainties of that underlying. Finally, Chapter 6 considers the application of these uncertainties into overall estimates of risk and reliability to illustrate the analysis and methods developed in the course of the work. A specific site on the southern flank of Georges Bank has been chosen for discussion. Specific information on the site has been introduced as needed throughout the report.

Descriptors: Offshore structures. Foundations. Ocean bottom. Settlement (Structural). Soil surveys. Uncertainty principle. Reliability. Probabilty theory. Soil mechanics

Identifiers: Risk analysis. NTISCOMHDA

F81-221438 NTIS Prices. PC A13/MF A03

**Terrain Analysis by Photo Interpretation**

Columbia Univ New York (OR8 850)

Semiannual status rept  
AUTHOR Strahler, Arthur n  
G2332F1 (R024  
15 Nov 57 50  
Contract nonr26650  
Distribution limitation now removed. NOTE: Only 35mm microfilm  
is available. No microfiche

Abstract No abstract available.

Descriptors: (\*Terrain intelligence, Aerial photographs), (\*  
Photographic analysis, Terrain), Aerial photography, Air  
intelligence, Plants(Botany), Soil mechanics, Terrain models,  
Aerial reconnaissance, Surface roughness, Analysis,  
Statistical analysis

Identifiers: Vegetation, NTISDDDXD, NTISDDDXDB

AD 148 374/2 NTIS Prices PC A02/MF A01

**Derivation of Parameters Necessary for the Evaluation of  
Performance of Sites for Deep Geological Repositories with  
Particular Reference to Bedded Salt, Livermore, California,  
Volume II. Appendices**

Goldier Associates, Inc., Kirkland, WA \*Department of Energy,  
Washington, DC (9505241)  
AUTHOR Ashby, J P.; Rawlings, G. E.; Soto, C. A.; Wood, D  
F.; Cheney, D W  
G135401 F1d 18G, 77G GRA18015  
Dec 79 172p  
Contract W-7405 ENG-48

Abstract The method of selection of parameters to be  
considered in the selection of a site for underground disposal  
of radioactive wastes is reported in volume I. This volume  
contains the appendix to that report. The topics include  
specific rock mechanics tests; drilling investigation  
techniques and equipment; geophysical surveying; theoretical  
study of a well test in a nonhomogeneous aquifer; and basic  
statistical and probability theory that may be used in the  
derivation of input parameters. (ERA citation 05-011360)

Descriptors: \*Radioactive waste disposal, \*Radioactive waste  
facilities, \*Site selection, Aquifers, Drilling, Geophysical  
surveys, Mathematical models, Radioactive wastes, Regional  
analysis, Rock mechanics, Statistics, Underground disposal

Identifiers: ERDA/052002, ERDA/510500, ERDA/58010G, Salt  
deposits, NTISDE

UCRI 151661V 2) NTIS Prices PC A08/MF A01

**The Shear Wave Velocity of Boston Blue Clay, Optimum Seismic  
Protection and Building Damage Statistics, Report Number 6**

Massachusetts Inst. of Techn., Cambridge, Dept. of Civil  
Engineering, \*National Science Foundation, Washington, DC,  
Engineering and Applied Science. (001450030)  
AUTHOR Trudeau, Paul Joseph  
G1121F1 F1d 8M, 8K, 48F, 50D GRA18013  
Feb 73 66p

Rept No: SOILS PUB-317; R73-12  
Grant NSF-GK-27955, NSF-GI-29936  
Monitor: NSF-RA-E-73-619

Abstract: The purpose of this report is to provide a best  
estimate of the shear wave velocity of Boston Blue Clay to be  
used in soil amplification studies in the design of structures  
in the Boston area against earthquakes. The in situ shear wave  
velocities determined using the cross-hole method by Weston  
Geophysical Research, Inc. are compared with values obtained  
using MIT's Hardin Oscillator and also empirical correlations  
proposed by Hardin and Black. Modifications to the laboratory  
values and the empirical results indicated herein agree  
favorably with the in situ shear wave velocities of 850 to 900  
feet per second.

Descriptors: \*Soil dynamics, Earthquakes, Seismic waves, Soil  
mechanics, Secondary waves, Massachusetts

Identifiers: Boston blue clay, Earthquake engineering,  
Boston(Massachusetts), NTISNSFRA

PB80-165285 NTIS Prices PC A04/MF A01

**Rock Slope Engineering Reference Manual. Part D: Slope Stability Analysis Methods**

Bureau (U. R. I. and Associates Ltd., Vancouver (British Columbia) Federal Highway Administration, Washington, DC Implementation Div. (060255000)  
GPO:74G1 Fld 138, 8G, 50A, 48F GRA18001  
Jan 79 185p.  
Contract D01-FH-11 921A  
Monitor: FHWA/TS-79/208-PT-D  
See also Part C, PB80-103328 and Part E, PB80-103344.  
Also available in set of 8 reports PC E19, PB80-103294.

**Abstract** The report discusses the various methods of slope stability analysis that are used for the different failure modes which are relevant in rock slopes. Basic theoretical aspects are discussed, as are some of the fundamental analysis methods that have been developed by workers in the field. In the Appendix, several typical problems are given which represent typical rock slope engineering problems that occur in practice. Answers to the various problems have been worked out and are described.

**Descriptors** \*Slopes; \*Slope protection; Engineering geology; Rock mechanics; Geologic structures; Failure; Reliability; Probability theory; Static stability.

**Identifiers** \*Foreign technology; Slope stability; Rock slopes; Discontinuities; NTIS00TFHA; NTISFNCA

PB80-103336 NTIS Prices PC A09/MF A01

**Risks and Costs for Ocean Structures**

Massachusetts Inst. of Tech., Cambridge Marine Industry Advisory Services (National Oceanic and Atmospheric Administration, Rockville, MD Office of Sea Grant, (001450231)  
AUFHQW Bidwell, John B.  
F2311J3 Fld 13J, 47, 85W GRA17925  
1 Jul 79 15p  
Rept No MITSG 79/18; OPPORTUNITY BRIEF-17  
Monitor NOAA-79080912  
Index No. 79-718 2im

**Abstract** Three domains of uncertainty affect the design and performance of offshore structures. One domain encompasses the sampling and testing of offshore soils and the extrapolation of soil conditions from discrete sampling points to areas under planned foundations. Another domain arises in considering the pattern of forces on offshore structures to be expected from winds and waves. The third arises in modeling the interaction of the system of sea/structure/foundation/soil. This report describes work at MIT oriented toward reducing the uncertainties in each of these three domains.

**Descriptors** \*Offshore structures; \*Hydrodynamics; Soil mechanics; Ocean waves; Structural design; Probability theory  
**Identifiers** Sea Grant program; Risk analysis; NTISCOMNOA  
PB 298 852/45T NTIS Prices PC A02/MF A01

**Effects of Earthquakes on System Performance of Water Lifelines. Seismic Design Decision Analysis**

Massachusetts Inst. of Tech., Cambridge Dept. of Civil Engineering (National Science Foundation, Washington, DC (220 010)  
AUFHQW Hein, Klaus H.; Whitman, Robert V.  
F2221B2 Fld 13B, 8K, 91J GRA17924  
May 76 84p  
Rept No R76-23  
Grant NSF-GI-27955  
Project MIT-Order-544  
Monitor NSI/RA-761699

**Abstract** Several past earthquakes and their impact on water systems are described, and characteristic damages which resulted are pointed out. Because of the importance of water lifeline networks after earthquakes, a method for analyzing the impact of earthquakes on their system performance is developed. The part of this analysis which deals with ground failure-induced damage to pipes in poor soil is applied to the water system of the Metropolitan District Commission, Commonwealth of Massachusetts. Various levels of pipe damage are simulated, and the impact of these damage levels on system performance is evaluated.

**Descriptors** \*Water services; \*Earthquakes; Water supply; Pipelines; Soil mechanics; Earth movements; Probability; Massachusetts; Disasters; Urban planning

**Identifiers** \*Seismic risk; \*Risk analysis; Earthquake engineering; Ground motion; NTISHSFRA

FB-208 797/25T NTIS Prices PC A05/MF A01

**Predicting Potential Heave and Heave With Time in Swelling Foundation Soils**

Arm. Engineer Waterway, Experiment Station Vicksburg Miss. (028100)

Final report  
AUTHOR Johnson, Lawrence B.  
FO02143 Fld 13M, 8M, 9B, 50B GRA17901  
Jul 78 194P  
Rept No. WES IR-5-78-7  
Monitor 1B

Abstract: this study evaluates procedures for predicting one dimensional potential heave of foundation soils, and the rate at which heave may occur. A computer program ULTRAL (ultimate and rate of heave) was developed for predictions of potential heave and heave with time based on two models for characterization of swell behavior. The soil suction and mechanical swell models. The soil suction model relates volume change with change in matrix soil suction and water content

Descriptors: Foundations(Structures); Soil mechanics; heaving; Computer programs; Soil models; Field tests; Soil tests; Civil engineering; Pore pressure; Moisture content; Soil dynamics; Statistical analysis

Identifiers: ULTRAL computer program. \*Soil Swelling. NTISDBPA

AD A054 069-55T NTIS Prices PC A09/MF A01

**Investigation of Blast Resistant Water Well Concepts**

Mechanics Research Inc. Los Angeles Calif. (388 746)

Final rept. 16 Apr 69. Jan 70  
AUTHOR Abitidskov, Dale P.; Gardner, Terry N  
E257253 Fld 17B, 13M, 18C GRA17824  
Jan 70 284P  
Contract N69799 69-C 0033  
Project MPI 7324  
Monitor NPEI CP 63 021  
Distribution limitation now removed

Abstract: Elements of a hardened water well were defined and sized to withstand weapon threats up to 5 MI, 3,000 psi in seven different subgrade profiles. Within the objective of achieving cost effectiveness of the well designs, an attempt was made toward uniformity and simplicity of approach across the range of threat and geological profiles. A test program was carried out to determine the susceptibility of pumps to shock and hydrodynamic pulse element costs and total well costs were determined for selected configurations in the different geological profiles. Considerable design and cost data are presented. Recommendations for further research and

development are made (Author)  
Descriptors: (Water wells, Vulnerability), (Underground structures, Nuclear explosions), Hardening, Simulation, Design threat evaluation, Blast, Construction materials, Construction, Shock waves, Statistical data, Costs, Soil mechanics, Stratigraphy

Identifiers: \*Hardened water wells. Sanguine project. NTISDBPA

AD 875 931/85T NTIS Prices PC A13/MF A01

**Statistical Theory of Fragmentation**

Los Alamos Scientific Lab., N Mex. Department of Energy. (

7820000)  
AUTHOR Dienes, J. K.  
E2134C2 Fld 81, 21D, 10A, 48A, 47K, 50D GRA17820  
1978 6P CONF 780509-4  
Rept No. CONF 780509-4  
Contract W 7405 ENG-96  
Monitor 1B  
19 Symposium on rock mechanics, Lake Tahoe, NV, USA, 1 May 1978

Abstract: An initially exponential distribution of cracks that grow in size and nucleate additional cracks is analyzed, leading to an expression for the statistical distribution of cracks as a function of time in closed form. The results are used to derive a reduced modulus for the cracked material. An approach to three-dimensional calculations of fragmentation is also discussed (ERA citation 03 036887)

Descriptors: Fragmentation, \*Rocks, Cracks, Distribution, Explosive fracturing, In-situ testing, Oil shales, Rock mechanics, Simulation, Statistical models, Time dependence

Identifiers: ERDA/O40401, ERDA/580300, \*Crack propagation, Cracking(Fracturing), NTISDE

LA UR 78 616 NTIS Prices PC A02/MF A01

**Storage. Retrieval and Statistical Analysis of Indiana Shale Data**

Purdue Univ., Lafayette, Ind Joint Highway Research Project --Federal Highway Administration, Indianapolis, Ind Indiana Div --Indiana State Highway Commission, Indianapolis

Interim rept  
AUTHOR van Zyl, Dirk J. A.  
E2103C2 Fld PG. 5B. 48F. 88B GRAI7820  
Jul 77 154p

Rept No JHRP-77-11  
Monitor FHWA/IND 78-JHRP77-11  
Prepared in cooperation with Federal Highway Administration, Indianapolis, Ind Indiana Div

Abstract This report gives a complete summary of the test data on shales generated by ISHC and Purdue University. Details are given for a very simple storage and retrieval system which is adequate for the small amount of data (163 sets) available at the present time. Results are presented from the different statistical analyses that were performed. These results include histograms, bivariate correlation coefficients and regression equations. Reasonably good bivariate correlations exist between the different indices describing the slaking resistance of shales. These correlations are however improved by using quadratic equations. Various regression equations are proposed for determining CBR from various parameters, usually a combination of five. It became clear during the investigation that it is important to have as many complete data sets as possible for future analyses. The standardization of testing methods is also of utmost importance in order to increase the potential of the data bank.

Descriptors \*Shales. \*Information systems. \*Statistical analysis. \*Indiana. Rock mechanics. Rock tests. Geology. Data processing. Information retrieval. Classification. Laboratory tests. Field tests. Management planning

Identifiers NTIS001FHA

PC-282 597/45T NTIS Prices PC A09/MF A01

**A Probabilistic Analysis of Embankment Stability Problems**

Arm, Engineer Waterways Experiment Station Vicksburg Miss. 1 038100)

Final rept  
AUTHOR Gilbert, Lawrence William  
D3424FA Fld 13B. 8M. 500 GRAI7723  
Jul 77 154p  
Rept No WES MR 5-77-10  
Monitor 1R  
Master's thesis

Abstract A probabilistic model is developed to predict the reliability of an embankment constructed on soft saturated clay. The model is based on a circular arc method of analysis, supplemented with a measure of the uncertainty in the resisting and overturning moments. The uncertainty in the overturning moment was considered negligible in this thesis. The uncertainty in the resisting moment was considered due to the uncertainties of bias, random testing error, and inherent soil variability. Two case studies were analyzed in this thesis by both the conventional method of analysis and the probability model. The results indicate that the uncertainties in bias correction factors are the dominant sources for both field vane testing and unconfined compression testing. The basic probability model is then extended to include the effect of embankment length on the computed failure probability. Two approaches are taken. The first is a direct extension of the basic model, considering the actual embankment length as a multiple of the minimum embankment length required to satisfy the assumption of plane strain. The second approach is a three dimensional probability model developed from a first passage failure criterion. (Author)

Descriptors \*Embankments. \*Clay. \*Soil mechanics. Probability Models. Stability. Construction. Reliability. Soil dynamics. Safety. Risk. Failure(Mechanics). Theses

Identifiers Probability theory. Soil stabilization. NTIS000DxA

AD A083 579/25T NTIS Prices PC A08/MF A01

**Statistical Estimations of Geological Material Model Parameters from Cylindrical In-Situ Test Data**

New Mexico Univ Albuquerque Eric H Wang Civil Engineering Research Facility (400976)

Final rept  
AUTHOR Isenberg, Jerrold, Collins, John D., Kenned, Bruce  
D256211 F14 8M 8K, 18C, 98, 500, 770 GRA1771

Mar 77 42p

Contract F27601 76 C 0015

Monitor AFML TR 76-187

Prepared in cooperation with Wiggins (J H) Co., Redondo Beach, Calif. Rept no 76 1259-1

**Abstract** A developmental study was performed to aid in the identification of soil properties from cylindrical in situ tests (CIST) data. A mathematical algorithm was developed which, using prior estimates of the properties and velocity-time history data from the tests, provides improved estimates of the parameters in the soil model. The algorithm was tested using a computational experiment, i.e., a finite difference code was used to generate a set of velocity-time history responses based on a predetermined set of parameters. The algorithm was then used to determine a set of parameters based on the data, and comparisons were made with the exact solution. After a number of cycles through the algorithm, a set of parameters was derived which provided satisfactory matching of the velocity-time history.

Descriptors \*Soil mechanics, \*Ground motion, \*Seismic waves, Shock waves, Dynamic response, Nuclear explosion simulation, Computerized simulation, Experimental data, Velocity, Finite difference theory, Estimates, Statistical analysis, Stress analysis, Military facilities, Structural response, Mathematical prediction, Hydrodynamic codes

Identifiers CIST shots, Allow hydrodynamic code, ESP computer program, Seismic velocity, NTISDDDXA

AD A679 184/751 NTIS Prices PC A03/MF A01

**A Short-Term Study of Beach Sand Movement Adjacent to Monterey Canyon**

Naval Postgraduate School Monterey, Calif (25) 4501

Master's thesis  
AUTHOR Davis, Vibert Morris, Harper, John Norman Jr., Harsha,

John Freeman

D231103 F14 9J 4111

May 66 54p

Monitor 18

Distribution limitation now removed

**Abstract** The movement of sand in the swath zone south of the

head of Monterey Canyon was studied during February and March, 1966. A stationary sampler was designed and used in conjunction with dyed fluorescent sands to trace the rate and direction of natural sand movement. A sequential multiple linear regression program was used to statistically analyze the effects of this canyon and several other environmental parameters on the movement of beach sand. In all observations made, the sand was found to move toward the canyon head. The canyon also appears to be a major factor affecting the rate of beach sand drift. (Author)

Descriptors (\*Sand, \*Beaches), Drift, Coastal regions, California, Markers, Ocean bottom topography, Sampling, Statistical analysis, Measurement, Samplers, Marine geophysics, Marine geology, Motion, Transportation, Soil mechanics

Identifiers Monterey bay, NTISDDDXD

AD 488 510/451 NTIS Prices PC A04/MF A01

AD-A136 355

COMPENDIUM OF ABSTRACTS ON STATISTICAL APPLICATIONS IN  
GEOTECHNICAL ENGIN..(U) ARMY ENGINEER WATERWAYS  
EXPERIMENT STATION VICKSBURG MS GEOTE..

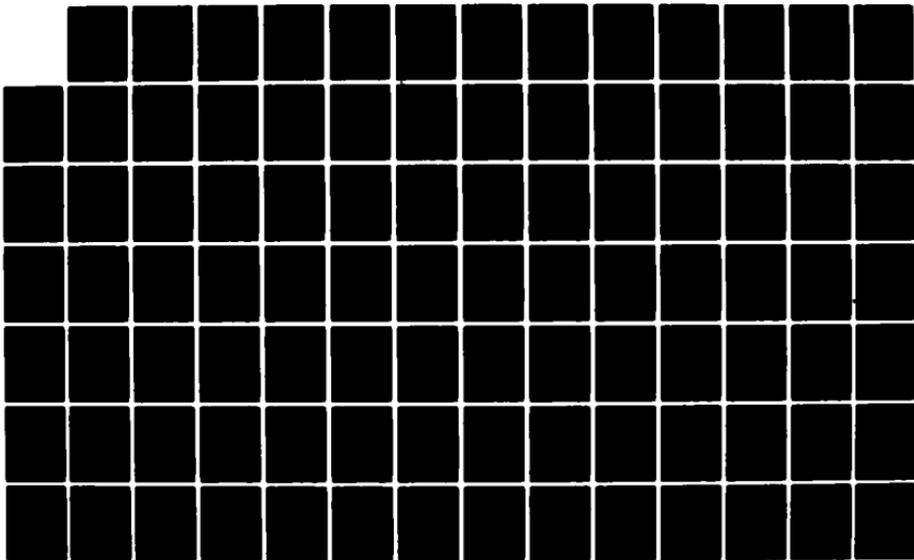
26

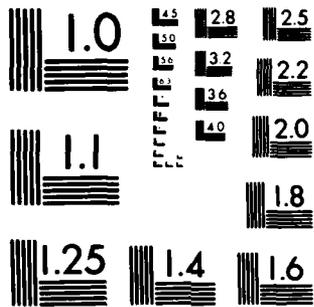
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M E HYNES-GRIFFIN ET AL. SEP 83

F/G 13/2

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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963-A

**Department of Defense Land Fallout Prediction System. Volume II - Initial Conditions**

Technical Operations Inc Burlington Mass (343 000)

Final rept.

AUTHOR: Norment, H. G.; Ing, W. Y. G.; Zuckerman, J

D2195G2 Fld: 18C, 18H, 8M, 48 d7712

30 Sep 66 73p

Rept No: 10-B-66-44

Contract: DA-18-035-AMC-346(A), DA-18-035-AMC-737(A)

Monitor: DA5A-1800-2

See also Volume I dated 27 Jun 66, AD-483 897L

Distribution limitation now removed.

**Abstract:** A set of initial conditions to serve as primary inputs to the Department of Defense Land Fallout Prediction System (DELFIIC) is derived. The set consists of lower-boundary conditions for use by a cloud rise and growth simulation model. The conditions are time, temperature, soil burden, and fraction of the soil burden in the vapor phase, and size-frequency distribution of fallout particles. The DoD Land Fallout Prediction System predicts local fallout patterns from land-surface nuclear detonations. (Author)

**Descriptors:** (+Nuclear explosions, Fallout), (+Fallout, Mathematical prediction), Surface burst, Louis(forces), Computer programming, Mathematical models, Soil mechanics, Particles, Clouds, Atmospheric temperature, Meteorological phenomena, Distribution, Statistical analysis, Meteorology, Time . Nuclear weapons, Computer logic, Operation, Underground explosions, Mathematical analysis, Specifications, Models(Simulations), Thermal radiation, Cratering, Aerosols

**Identifiers:** Nuclear fireball, Fortran, Nuclear weapons, Weapons effects, Point-source dissemination, ViroId(Nuclear explosions), NTISD00XD

AD-803 144/55T NTIS Prices: PC A04/MF A01

**Trafficability Classification of Thailand Soils**

Army Engineer Waterways Experiment Station Vicksburg Miss (038 100)

Final rept, Aug 64-May 66

AUTHOR: Meyer, M. P.

D2054J4 Fld: 8M d7711

Jan 67 143p

Rept No: AEWES-TR-3-753

Project: DA-1-V-O-21701-A-046

Task: 1-V-O-21701-A-046-02

Monitor: 18

Distribution limitation now removed.

**Abstract:** Pertinent soil trafficability data were collected

during the wet season at 846 sites in Thailand. The soils were identified according to the Unified Soil Classification System and the U. S. Department of Agriculture textural Classification system. Two general topographic positions (high topography and low topography) and two general levels of wetness were considered. A scheme for classifying soils according to their trafficability was developed. The scheme lists the soil types in order of decreasing trafficability under each of three topography-wetness level categories and shows the probability of successful passage on each soil for vehicles of known soil strength requirements. The scheme permits the estimation of the probability of a successful operation for given soil type, topography, and wetness-level conditions. If a choice of several routes and vehicles is available, the determination of the vehicles with the best chances of success over a given route or of the best route for given vehicles can be made. (Author)

**Descriptors:** (+Soils, Trafficability), (+Thailand, Soils), Mobility, Terrain, Moisture, Soil mechanics, Classification, Operation, Vehicles, Tables(Data), Probability, Statistical analysis, Plastic properties, Mechanical properties

**Identifiers:** Mers(Mobility environmental research study), Mobility, Offroad traffic, NTISD00XD

AD-R08 540/95T NTIS Prices PC A07/MF A01

**Pressure and Gravity Effects on the Simulation of Meteorite Impact Craters**

Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering (012 225)

Master's thesis  
 AUTHOR: Smith, Jerry Alan; Franklin, Eldon Gene  
 D1924J1 Fld: 38, 19D, 8G d7710  
 Jun 67 158p  
 Rept No: GSF/MC/67-2  
 Monitor: 18  
 Distribution limitation now removed.

**Abstract:** Meteorite impact craters were simulated by detonation of chemical explosives in a cohesionless medium at various air pressures (0.005 mm Hg to 1000 mm Hg) and at four gravity conditions (0.17 g, 0.38 g, 1.0 g, and 2.5 g). Crater parameters (diameter and depth) were measured to determine the effects of pressure and gravity on the cratering process. Lip height was measured only in the pressure work. Diameter and depth increased approximately 12% and 10% respectively with decreasing pressure while lip height remained relatively constant. Crater diameter decreased from a mean value of 47.9 cm at 0.17 g to 33.7 cm at 2.5 g. Depth did not vary appreciably from 1.0 g to 2.5 g (7.7 cm to 5.7 cm). A scaling equation was derived to relate crater diameter, pressure, gravity, and energy in a cohesionless medium within the pressure range of 300 mm Hg to 1000 mm Hg and the gravity range of 0.17 g to 2.5 g. To obtain additional information on the mechanics of crater formation, craters were formed in mediums with horizontal layering. Scouring and compaction were found to be predominant processes in both the pressure and gravity phases. (Author)

**Descriptors:** (\*Meteorites, \*Cratering). (\*Extraterrestrial topography, Configuration). Gravity, Pressure, Energy, Model tests, Impact, Explosion effects, Velocity, Shear stresses, Epicenters, Shock waves, Soil mechanics, Statistical processes. Analysis of variance, Vacuum apparatus, Photographic analysis, Theses, Mars(Planet), Moon

**Identifiers:** Craters, Impact craters, NTISD00XD  
 AD-817 796/65T NTIS Prices: PC A08/MF A01

**Experimental Stress Analysis of Overpressure Facility for Project Hest II, Minuteman Missile Site D-1**

Air Force Weapons Lab Kirtland AFB N Mex (013 150)

Technical rept. Jun-Jul 66  
 AUTHOR: Ayala, Santos J.  
 D1875DA Fld: 16A, 16D d7710  
 Mar 67 32p  
 Rept No: AFSWC-TR-66-35

Project: AF-1338T-324  
 Monitor: 18  
 Distribution limitation now removed.

**Abstract:** Stress data were obtained during a surcharge loading of the HEST II overpressure facility. The two objectives accomplished were the control of the surcharge loading and an evaluation of the load-carrying capacity of the facility. The behavior of the structure was determined during the surcharge loading using the strain gage technique and observing the stress-strain relationships. A preliminary qualitative analysis was made to determine the structure mode of failure. Stress-strain relationships in the elastic range were obtained by analytical methods. Specimens were taken from each structural member at locations of anticipated maximum stress. Uniaxial tensile tests were conducted on these specimens to determine the characteristic stress-strain curve of each material. The main function of the facility was to resist loads that were applied to it. Although the facility experienced some localized yielding, there was no structural damage. Apart from tabulated results, the report includes a general discussion and other pertinent background material to acquaint the reader with the techniques used to obtain the stress information and to achieve the required objectives. (Author)

**Descriptors:** (\*Guided missile launchers, Stresses), Guided missile silos, Launching, Surface to surface missiles, Solid propellant rocket engines, Pressure, Loads(Forcns), Compressive properties, Strain gages, Underground, Beams(Structural), Steel, Soils, Soil mechanics, Moments, Shells(Structural forms), Statistical analysis, Plastic properties, Tensile properties, Shear stresses, Launching sites

**Identifiers:** Hest project, Minuteman, Overpressure hardening, NTISD00XD

AD-812 373/95T NTIS Prices: PC A03/MF A01

**The Effect of Temperature and Confining Pressure on Fluid Flow Properties of Consolidated Rocks**

Stanford Univ., Calif. Stanford Geothermal Program, National Science Foundation, Washington, D.C. Research Applied to National Needs.  
Author: Cass, Francis J.  
D1651F1 Fid: 81, 97P GRA17708  
Nov 74 134p  
Rept No: SGP-TR-3  
Monitor: NSF/RA/N-74/328

Abstract: Recent work on the effect of temperature on relative permeability suggested that absolute permeability was also a temperature dependent property of rocks. Equipment originally designed to perform dynamic displacements through consolidated sandstone samples was modified and used to measure absolute permeability under conditions of elevated temperature and overburden pressure. Whenever a temperature dependence was evidenced, the combined effect of pure mechanical stresses and thermally induced stresses was studied. The effect of temperature on gas slippage and turbulence coefficient was also analyzed.

Descriptors: (Geothermal) prospecting, Rock mechanics, Fluid flow, Rock properties, Sandstones, Permeability, Viscosity, Flow rate, Rocks, Numerical analysis, Tables(Data), Statistical data

Identifiers: NTISNSFRA

P8-282 732/151 NTIS Prices: PC A07/MF A01

**Airfield Pavement Evaluation, Usnas Whidbey Island and Ushoff Coupeville, Washington**

Naval Civil Engineering Lab Port Huenele Calif (248 150)

Final rept., Aug 66-Sep 67  
AUTHOR: (Ambrotte, D. J.; Chamberlin, W. H.)  
D1582K3 Fid: 1E, 11B d7708  
Oct 67 271p  
Rept No: NCEL-TN-939  
Project: 125N  
Monitor: 18  
Distribution limitation now removed.

Abstract: An evaluation of the pavements at U. S. Naval Air Station Whidbey Island and U. S. Naval Outlying Field Coupeville, Washington is presented with the allowable gross load capacities of the runways, taxiways, and parking aprons for single, dual, single-tandem, and dual-tandem wheel assembly aircraft. Information is also included on the construction history, design pavement sections, climatic data, current aircraft traffic, and pavement and subsurface materials. Results of the evaluation show that asphaltic

concrete Taxiway B and all portland cement concrete pavements with thicknesses of less than 8 inches, including the pavement at NOLF Coupeville, are being overlaid by some aircraft currently operating at the air station. (Author)

Descriptors: (Pavements, Landing fields), (Naval shore facilities, Landing fields), Air traffic, Asphalt, Cements, Concrete, Pavements, Soil mechanics, Climate, Construction materials, Statistical mechanics, Mechanical properties, Loads(forces), Runways, Air traffic control terminal areas, Aircraft landings, Landing gear, Washington(State)

Identifiers: NTISDDDXD

AD 826 363/45T NTIS Prices: PC A12/MF A01

**Detail Survey of Riverine Environment**

Detroit Univ Mich Dept of Civil Engineering (402 845)  
AUTHOR: Lassaline, David M.; Sloss, David A. Jr.; Baker, Warren J.; Miranda, Constantino X. C. F.  
D1025K2 Fid: 8H d7704  
Mar 67 160p

Contract: DA-20-113-AMC-09099(T)  
Monitor: TACOM-TR-10002  
Distribution limitation now removed.

Abstract: A survey was made along the Black and the Huron Rivers in southern Michigan to determine the character and magnitude of the riverine environment. This was a pilot study to assess the feasibility of intensive riverine surveys. Significant factors, and methods to collect the data. Eighty-two sites were surveyed. Survey data concerning cross-sections, soil properties and strengths, vegetation characteristics, and conditions along the channel bottom, is included in the report. Methods for gathering the data, types of data gathered, analysis, conclusions, and recommendations for future survey techniques are discussed. (Author)

Descriptors: (Rivers, Hydrographic surveying), River currents, Soils, Plants(Rotary), Soil mechanics, Statistical analysis, Amphibious operations, Michigan, feasibility studies

Identifiers: Banks(Waterways), Rivers, River basins, River crossings, NTISDDDXD

AD-844 066/15T NTIS Prices: PC A08/MF A01

parallel with the depositing wind current and imbricated in conformity with established criteria of sedimentation. Orientation of silt grains in the material influenced the directional shear strength considerably. A significant reduction of shear strength was found where specimens were stressed parallel to the plane of preferred grain orientation and imbrication. Microstructural anisotropies in Vicksburg loess also reflected definite variation in shear strength as determined by triaxial compression tests. (Author)

Descriptors: (\*Soils, Microstructure), Shear stresses, Compressive properties, Site selection, Foundations (Structures), Minerals, Chemical analysis, Particle size, Statistical analysis, Flexural strength, Silt, Failure (Mechanics), Engineering geology, Soil mechanics, Military facilities, New Mexico

Identifiers: \*Loess, \*Soil analysis, Triaxial tests, NTISD00XD

AD-871 569/OST NTIS Prices: PC A08/MF A01

parallel with the depositing wind current and imbricated in conformity with established criteria of sedimentation. Orientation of silt grains in the material influenced the directional shear strength considerably. A significant reduction of shear strength was found where specimens were stressed parallel to the plane of preferred grain orientation and imbrication. Microstructural anisotropies in Vicksburg loess also reflected definite variation in shear strength as determined by triaxial compression tests. (Author)

Technical note Sep 67-Mar 68  
AUTHOR Lambotte, D. J.; Brownie, R. B.  
D0274L3 Fld: 1E, 13B d7702

Nov 68 273p  
Rept No: NCEL-TN-997  
Project NAVFAC-125U  
Monitor: 18  
Distribution limitation now removed.

Abstract: The evaluation of the pavement at the U. S. Naval Auxiliary Air Station, Fallon, Nevada is presented with the allowable gross load capacities of the runways, taxiways, hardstands, and parking aprons for single, dual, single-tandem, and dual-tandem wheel assembly aircraft. (Author)

Descriptors: (\*Naval air stations, \*Landing fields), (\*Pavements, Loads (Forces)), Runways, Reinforced concrete, Asphalt, Traffic, Trafficability, Soil mechanics, Statistical analysis, Pictures, Nevada

Identifiers: Evaluation, Graphs (Charts), NTISD00XD

AD-845 177/55T NTIS Prices: PC A12/MF A01

### The Microstructure of Loess and Its Relationship to Engineering Properties

Air Force Weapons Lab Kirtland AFB N Mex (O13 150)

Technical rept, May 68-Feb 69  
AUTHOR Matalucci, Rudolph V.  
C7672R4 Fld: 8M d7625

Jun 70 157p  
Rept No: AFWL-TR-69-168  
Project: AF-921A  
Task: 921A06  
Monitor: 18  
Distribution limitation now removed.

Abstract: The microstructure of a loessial soil in an attempt to correlate structural or fabric anisotropies with variations in shear strength is examined. Oriented thin sections of undisturbed loess samples were prepared and measurements were made directly on photomicrographs to determine the degree of preferred orientation of silt grains. The overall effect of microstructure and grain orientation on strength properties was evaluated by direct shear and triaxial compression tests. Significant grain orientation was found in both horizontal and vertical planes of undisturbed loess samples. Preferred grain orientation and imbrication conformed to postulated paleowind directions. Silt-sized particles were found to be oriented

**The Influence of Soil and Rock Properties on the Dimensions of Explosion-Produced Craters**

Texas a and M Research Foundation College Station (347 320)

Technical rept. Feb 70-Oct 71

AUTHOR: Dillon, Larry A.

C730311 Fld: 19D, 18C d7622

Feb 72 17pp

Contract: F29601-70-C-0032

Project: AF-5710, DNA-NMER-SA-102

Monitor: AFML-TR-71-144

Distribution limitation now removed.

Abstract: Analysis of data from published cratering experiments shows the effects of soil and rock properties on the apparent dimensions of explosion produced craters. By regression analysis, using bell shaped curves, prediction formulas were developed for the apparent crater radius, depth, and volume as a function of charge weight and depth of burst for eight different types of materials. The bell curves were normalized using material properties and prediction equations were generated using all the data. These general equations were then studied to determine the specific effects of the material properties on resultant apparent crater dimensions. Material properties are highly important in determining the size of explosion-produced craters.

Descriptors: (\*Cratering, \*Nuclear explosions), Mathematical models, Rock, Soils, Engineering geology, Computer programs, Regression analysis, Predictions, Statistical distributions, Explosives, Model theory, Seismic waves, Velocity, Guided missile sites, Surface burst, Underground explosions, Density, Weight, Moisture, Vaporization, Volume, Soil mechanics, Mechanical properties, Shear stresses, Experimental data, Structural properties, Compacting

Identifiers: Depth, Rock mechanics, Saturation, Specific gravity, Yield(Nuclear explosions), NTIS000XD

AD-891 964/95T NTIS Prices: PC 408/MF A01

**Multiple-Wheel Heavy Gear Load Pavement Tests, Volume III, Part B. Presentation and Initial Analysis of Stress-Strain Deflection and Vibratory Measurements, Data and Analysis**

Army Engineer Waterways Experiment Station Vicksburg Miss (038 100)

Technical rept. 1 Jan 68-1 Aug 71

AUTHOR: Leubetter, Richard H.; Rice, John L.

C730204 Fld: 1E, 13R, 20K d7622

Nov 71 547p

Project: AF-5224, FAA-ER-450-034A

Task: 522404

Monitor: AFML-TR-70-113 Vol-3-Pt-B

See also Volume 3, Part A, AD-890 779L. Distribution limitation now removed.

Abstract: Flexible and rigid pavement test sections were constructed and tested to gain information on pavement and soil behavior under large aircraft loadings. These test sections incorporated instrumentation systems designed to determine the response of the pavement structures of static, dynamic (slowly moving), and vibratory loads and to traffic by full prototype loadings. This volume covers data reduction, analysis, and the findings of the instrumentation and vibratory testing programs; Appendices A and B contain details of instrumentation measurements for flexible and rigid pavements, respectively. (Author)

Descriptors: (\*Runways, Loads(Forces)), (\*Aircraft, Weight), Pavements, Soil mechanics, Stresses, Strain(Mechanics), Deflection, Statistical data

Identifiers: Flexible pavements, Multiple wheel loading, NTIS000XD

AD-890 780/05T NTIS Prices: PC A23/MF A01

**The Behavior of Statistically Heterogeneous Excavated Earth Slopes**

Auburn Univ., Ala. Dept. of Civil Engineering. Federal Highway Administration, Washington, D.C. Alabama State Highway Dept., Montgomery. Bureau of Research and Development.

Supplemental rept. Dec 72-Mar 74 (Final)

AUTHOR: Ramey, George E.

C4905B2 Fld: 08M, 13B, 50D, 50A GRA17517

Jun 74 181p

Rept No: HPR-67-B

Monitor: 18

See also PB-224 916. Prepared in cooperation with Alabama State Highway Dept., Montgomery. Bureau of Research and Development.

**Abstract:** The computer program which was originally developed for evaluating the behavior of earth slopes has been modified, extended, and further tested and documented. The program can now handle soil excavation problems, embankment problems, and in-plane elasticity problems. The constituent materials in each of these problem types may be layered in horizontal layers and taken as deterministic or statistically heterogeneous. The program uses an incremental procedure in the simulation of earthwork excavation or filling and thereby solves nonlinear problems in a piecewise linear manner.

**Descriptors:** \*Highways, \*Slopes, \*Revetments, \*Soil mechanics, \*Soil properties, Computerized simulation, Computer programs, Alabama, FORTRAN

**Identifiers:** Finite element analysis, DOT/48Z/BA, DOT/4CZ/CA, FORTRAN 4 programming language, NTISD0TFHA

PB-241 917/4ST NTIS Prices: PC A09/MF A01

**Analysis of Large Scale Non-Coal Underground Mining Methods**

Dravo Corp., Pittsburgh, Pa. Eastern Construction Div. Bureau of Mines, Washington, D.C.

Summary rept., 30 Jun 72-15 Jan 74.

C4193G3 Fld: RI, 48A, 50D GRA17422

Jan 74 581p

Contract: 50122059

Monitor: BUMines-DR-36-74

**Abstract:** This report identifies problem areas requiring research, identifies potential innovations to improve technology, and provides a basis for anticipating future needs of the large scale noncoal mining industry. It contains statistics on underground mining methods and includes information on the equipment and systems used, and costs and productivity. Particular emphasis is placed on current practices and problems, needed technological improvements,

existing or potential environmental conflicts, and possible modifications that will assist in meeting projected national mineral needs. Current practices for various mining methods, including block caving, room and pillar, vein mining, in situ mining, and variations of these methods are described.

**Descriptors:** \*Underground mining, \*Mining engineering, Mineral deposits, Excavating equipment, Rock excavation, Mines(Excavations), Room and pillar mining, Caving mining, Ore sampling, Drill core analysis, Underground supporting, Blasting, Mine shafts, Rock drilling, Slope mining, Rock bolts, Rock mechanics, Requirements, Statistical data

**Identifiers:** Vein mining, In situ mining, NTISD0EBM

PB-234 555/1 NTIS Prices: PC A25/MF A01

**Continuously Reinforced Concrete Airfield Pavement. Volume I. Tests on Existing Pavements and Synthesis of Design Methods**

Austin Research Engineers Inc Tex (408700)

Final rept. Feb 72-Dec 73

AUTHOR: Treybig, Harvey J.; McCullough, B. Frank; Hudson, W.

Ronald

C3072E4 Fld: 1E, 85A GRA17416

May 74 212p

Contract: F29601-72-C-0057, DOT-FA71WAT-218

Project: AF-683M

Monitor: FAA-RD-74-33-1

Sponsored in part by Army Engineer Waterways Experiment Station, Vicksburg, Miss See also Volume 2, AD-779 953.

**Abstract:** The report contains support documentation of design methods for continuously reinforced concrete pavements, both overlays and new construction. The experimental investigations of continuously reinforced concrete airfield pavements conducted as part of this research are described and analyzed. The field studies provide experimental validation of the design procedure. The report includes the general outline and analysis for design procedure for both overlay and new pavement. It includes a discussion of material evaluation requirements, handling of aircraft traffic projections for use in fatigue design, and the development of a fatigue curve. The report includes construction recommendations and suggestions based on the current state of knowledge and experience. A comparison is presented of the analyses and observations made on the pavements investigated in the field study. (Modified author abstract)

**Descriptors:** Pavements, Runways, Test methods, Reinforced concrete, Performance(Engineering), Bituminous coatings, Landing fields, Failure(Mechanics), Nondestructive testing, Coverings, Construction materials, Soil mechanics, Loads(Forces), Deformation, Fracture(Mechanics), Stresses, Deflection, Statistical analysis

**Identifiers:** Design, Portland cements, Pavement distress, NTISAF

AD-780 511/2 NTIS Prices: PC A10/MF A01

**Formation of Elastoplastic Deformations of Soil under Impact Compression**

Foreign Technology Div Wright-Patterson AFB Ohio (141600)

AUTHOR: Stavitsker, I. R.

C2994G4 Fld: 8M GRA17415

17 Apr 74 19p

Rept No: FTD-HT-23-787-74

Project: AF-1369

Task: 136901

Monitor: 18

Edited trans. of Vsesoyuznogo Simpoziuma po Rasprostraneniye Uprugikh i Uprugo-Plasticheskikh Voln (3rd), Moscow, 1969 Papers, n.p., n.d., p264-276, by Victor Mesenzeff.

**Abstract:** A method is proposed for calculation stresses and strains in the soil under the effect of impact on its surface, which is based on the theory of propagation of elastoplastic waves in a semi-infinite rod. Based on the obtained data, elastoplastic models have been constructed for certain types of soil which are used for practical calculations. In this work the results of these calculations are compared with the data of impact soil compaction under natural conditions.

**Descriptors:** Soil mechanics, Stresses, Deformation, Compressive properties, Elastic properties, Strain(Mechanics), Mathematical models, Dynamic loads, Statistical functions, Least squares method, Impact tests, Translations, USSR

**Identifiers:** NTISAF

AD-779 665/9 NTIS Prices: PC A02/MF A01

DIAGLOG File6: NTIS - 64-62/iss20 (Copr. NTIS) (Item 34 of 148) User 5208 1sep82

**Statistical Comparison of the Pulse and Resonance Methods for Determining Elastic Moduli**

Bureau of Mines, Washington, D.C. (068 450)

Rept. of investigations

AUTHOR: Inhill, Richard E.; Peng, Syd S.

C28303 FID: 8G, 500 GRA17412

Feb 74 29p

Rept No: BuMines-RJ-783f

Monitor: 18

Prepared by Twin Cities Mining Research Center, Minneapolis, Minn.

**Abstract:** Elastic wave velocities and moduli were determined by both the pulse and resonance methods in a large number of specimens of St. Cloud Gray Granodiorite and Tennessee marble under the same moisture, temperature, and stress environments. Statistical comparisons between the Young's shear, and bulk moduli and Poisson's ratios obtained independently by the pulse and resonance methods do not give equivalent results in nearly isotropic rock. The amount of difference varies for each modulus with least difference (less than 5 pct) occurring in the shear modulus and greatest difference (as high as 34 pct) in the bulk modulus. (Modified author abstract)

**Descriptors:** \*Modulus of elasticity, \*Rock properties, \*Rock mechanics, Marble, Comparison, Statistical analysis, Tests

**Identifiers:** Granodiorite, BM

PB-231 106/6 NTIS Prices: PC A03/MF A01

**The Behavior of Statistically Heterogeneous Excavated Earth Slopes**

Auburn Univ., Ala. Dept. of Civil Engineering.

Rept. no. 1, Dec 70-Dec 72

AUTHOR: Kraft, Leland M. Jr.; Mukhopadhyay, Jnanabrata

C2044C2 FID: 8M, 13B, 50B, 50A GRA17402

Dec 72 215p

Rept No: IWR-67-A

Monitor: 18

Sponsored in part by Alabama State Highway Dept., Montgomery.

**Abstract:** The performance of statistically heterogeneous excavated earth slopes has been studied by using the deformations on the slope boundary as a measure of the performance. The pertinent parameters of the study are the angle of the slope, the initial stresses as reflected by the earth pressure at rest, the ratio of the soil stiffness to the soil cohesion, Poisson's ratio, the stability number, the safety factor, and the coefficient of variation of the cohesion. The results are summarized in several graphs showing the quantitative influence of soil heterogeneity, number of

samples, and the definition of failure on the selection of samples, and the definition of failure on the selection of the safety factor for a requisite reliability.

**Descriptors:** \*Highways, \*Slopes, \*Revetments, \*Soil mechanics, Soil properties, Civil engineering, Alabama, Computer programs

**Identifiers:** FHAPR

PB-224 916/7 NTIS Prices: PC E08/MF A01

**Settlement Prediction: A Probabilistic Approach**

Massachusetts Inst. of Tech., Cambridge, Dept. of Civil Engineering. (220 010)

Final rept.

AUTHOR: Diaz-Padilla, Jorge; Vanmarcke, Erik H.

C199263 FID: 13M, 8M, 50D\*, 89D GRA17401

Aug 73 84p

Grant: NSF-GK-25501

Monitor: 18

Also available as Structures Pub-375. Sponsored in part by National Bureau of Standards, Washington, D.C., and Department of Housing and Urban Development.

**Abstract:** A probabilistic soil-structure interaction model is developed which yields first-order probabilistic information (i.e., means, standard deviations and correlation coefficients) about the movements of the foundation in terms of prescribed probabilistic input about loads and soil properties. The proposed method is applicable only to linear elastic structures supported on shallow foundations, but bounds are suggested for the means and standard deviations of the differential settlements in the case where settlement-induced stiffness deterioration occurs. The uncertainty of joint displacements and forces imposed on the structure by random deformation of its foundation is also discussed. (Author)

**Descriptors:** (\*Foundations, Settlement(Structural)), (\*Soil mechanics, Foundations), Soil pressure, Bearing capacity, Structures, Interactions, Probability theory, Random variables

**Identifiers:** NSF

PB-225 047/0 NTIS Prices: PC A05/MF A01

embankment. The overall compaction control achieved for each major embankment zone is indicated by frequency histograms, cumulative frequency distributions, and various statistical parameters for variation of both water content and density. (Author)

Descriptors: (Dams, Foundations(Structures)), (Soil mechanics, Dams), Statistical analysis, Density, Construction materials, Specifications, Moisture, Test methods, Rivers, Massachusetts

Identifiers: Littleville Dam, Westfield River, Earth dams, Embankments, Earth fills

AD-756 196 NTIS Prices: PC A05/MF A01

**Development of a Terrain Prediction Model for West Germany**  
Army Materiel Systems Analysis Agency Aberdeen Proving Ground Md (403910)

Technical memo.  
AUTHOR: Salisbury, Neil E.  
CJp52J4 Flid: 15D, 8B, 74G, 64A GRAI7324  
Jun 73 85p  
Rept No: AMSAA-TM-168  
Project: DA-1-P-765801-MM-11  
Task: 1-P-765801-MM-1102  
Monitor: 1B

Abstract: The report describes in detail the efforts conducted to develop a terrain prediction model for examining vehicle mobility in West Germany. The analyses conducted to develop the model and the results obtained when applying the model to areas of West Germany with known terrain characteristics are discussed in detail. Conclusions are presented about the quality and representativeness of the US Army Engineer Waterways Experiment Station terrain data, the efficacy of the developed model and recommendations as to future efforts in terrain analysis. (Author)

Descriptors: (Terrain intelligence, West Germany), (Vehicles, Mobility), Terrain models, Trafficability, Site selection, Soil mechanics, Hydrology, Statistical data

Identifiers: A

AD 768 704/3 NTIS Prices: PC A05/MF A01

**Analysis of Field Compaction Data. Report 2: Littleville Dam, Westfield River, Massachusetts**

Army Engineer Waterways Experiment Station Vicksburg Miss (081001)  
AUTHOR: Torrey, Victor H. III  
COS23D3 Flid 13B, 8M, 60B GRAI7308  
Dec 70 82p  
Rept No: AEWES Misc-Paper-S 70-13  
Monitor: 1B

Abstract: The report is a review of the materials, specifications, procedures, equipment, and testing pertinent to construction and compaction control of the earth-fill embankment of Littleville Dam, Westfield River, Mass., constructed by the U. S. Army Engineer Division, New England. This report includes summation and analyses of the compaction control data submitted by the division to the U. S. Army Engineer Waterways Experimental Station. Statistical analyses are presented on the variation of fill water content from laboratory optimum water content and the variation of fill dry density from laboratory maximum dry density, based on results of field density sampling in each major zone of the

**Multiple-Wheel Heavy Gear Load Pavement Tests. Volume III. Part B. Presentation and Initial Analysis of Stress-Strain Deflection and Vibratory Measurements. Data and Analysis**

Army Engineer Waterways Experiment Station, Vicksburg, Miss. (OSR 100)

Technical rept. 1 Jan 68-1 Aug 71  
AUTHOR: Ledbetter, Richard H.; Rice, John L.  
A5374E4 FID: 1E, 13B, 51E GRAI7223

Nov 71: 547p

Project: AF 5224, FAA-ER-450-034A

Task: 522404

Monitor: AFML-TR-70-113-Vol-3-Pt-B

See also Volume 3, Part A, AD-779 and Volume 4, AU-890 668.  
Distribution Limitation now Removed.

**Abstract:** Flexible and rigid pavement test sections were constructed and tested to gain information on pavement and soil behavior under large aircraft loadings. These test sections incorporated instrumentation systems designed to determine the response of the pavement structures of static, dynamic (slowly moving), and vibratory loads and to traffic by full prototype loadings. This volume covers data reduction, analysis, and the findings of the instrumentation and vibratory testing programs; Appendices A and B contain details of instrumentation measurements for flexible and rigid pavements, respectively. (Author)

**Descriptors:** (\*Runways, Loading(Mechanics)), Aircraft, Weight, Pavements, Soil mechanics, Stresses, Strain(Mechanics), Deflection, Statistical data

**Identifiers:** Multiple wheel loading, Flexible pavements

AD-890 780 NTIS Prices: PC E14/MF A01

**Soil Stabilization - The Effects of Mixing Conditions, Method of Compaction, and Curing Conditions on the Effective Stress-Strength Behavior of a Stabilized Soil**

Massachusetts Inst of Tech Cambridge Soil Mechanics Div ( 220080)

These rept. no. 9 on soil stabilization  
AUTHOR: Wissa, Anwar E. Z.; McGilivray, Ross T.; Paniagua, Jose Guillermo

A5092J3 FID: 8M, 64L GRAI7220

Aug 71 75p

Rept No: R71-34; Soils Pub-287

Contract: DA-22-079-eng-465

Project: DA-1-T-061102-B-52-A

Task: 1-T-061102-B-52-A-01

Monitor: AEMES-CR-3-63-9

See also report dated Jan 70, AD-711 536.

**Abstract:** The effects of mixing conditions, method of compaction, and curing conditions on the strength behavior of a cement-stabilized clayey silt were investigated using consolidated-undrained triaxial compression tests with pore pressure measurements. The results were analyzed using the Mohr-Coulomb criterion of failure in terms of effective stresses. The results of the testing program showed that the consistency of the soil prior to the addition of cement is the most important factor controlling the mixing quality. The use of a mechanical device for mixing was not found to be inherently inferior to the standard laboratory mixing procedure. (Author)

**Descriptors:** (\*Silt, Soil mechanics), (\*Soils, Stabilization), Clay, Compressive properties, Shear stresses, Density, Strain(Mechanics), Pressure, Water, Statistical data, Mixtures, Aging(Materials), Cements

**Identifiers:** \*Soil stabilization, Portland cements, Pore pressure

AD-747 351 NTIS Prices: PC A04/MF A01

**Rational Pavement Evaluation - Review of Present Technology. Volume II**

Naval Civil Engineering Lab., Port Hueneme, Calif (248 150)

Technical rept. Feb 68-Jun 69.  
A495411 FID: 1E, 51E GRA17218

May 70 45p

Project: AF 5713

Task: 571324

Monitor: AFNL-TR-69-9-Vol-2

See also AD-864 411. Distribution Limitation now Removed.

**Abstract:** A detailed research and development plan is described outlining a research program to evolve a rational pavement evaluation procedure. This procedure can be used to determine the load rating of airfield pavements to enable establishment of aircraft assignments and allowable gross aircraft loads for military airfields. The report outlines four areas of research: structural analysis of pavements, engineering properties of paving materials, pavement mechanics, and aircraft operational characteristics. Work unit statements are presented which describe the scope and objective of the research considered necessary to develop a provisional pavement evaluation procedure. This initial research will require a development period of 3 years (Author)

**Descriptors:** (Landing fields, Pavements), (\*Pavements, Reviews), Statistical analysis, Structural properties, Soil mechanics, Construction materials, Asphalt, Reinforced concrete, Cracks, Surface roughness, Reliability, Reports

AD-872 662 NTIS Prices PC E02/MF A01

**Statistical Relationships between Geotechnical Properties of Gulf of Mexico Sediments**

Texas A and M Univ College Station (347350)  
AUTHOR: Bryant, William R.; Trabant, Peter K.  
A434102 FID: 8J, 8M, 7811 GRA17218  
1972 6p

Rept No: Contrib-491

Contract N00014-68-A-0308, NGA-2-35213

Prepared for presentation at the Offshore Technology Conference (4th annual), Houston, Tex., May 1-3, 1972. Paper no. OTC-1654.

**Abstract:** The design of adequate foundations for offshore installations, of all natures, requires a knowledge of the engineering properties of the sediments from the first dozen meters below the ocean floor. This study presents the profiles of shear strength, water content and bulk (wet) density to a depth of 12 meters for eighty cores retrieved from all provinces of the Gulf of Mexico. (Author)

**Descriptors:** (\*Mexico Gulf, Sedimentation), (\*Ocean bottom sampling, Mexico Gulf), Depth finding, Soil mechanics, Density, Interfaces

Identifiers: Offshore structures

AD-746 139 NTIS Prices PC A02/MF A01

**Statistical Characteristics of Equipment for Simultaneous Working Soil and Seeding (Statisticheskie Kharakteristiki Agregata dlya Sovmeshchennoi Obrabotki Pochvy i Poseva)**

National Tillage Machinery Lab., Auburn, Ala.  
AUTHOR: Doganovskii, M. G.; Klein, V. F.; Enekeev, V. G.  
A4792F4 FID: 2C, 52C GRA17216

8 Jun 72 6p

Rept No. NTML WRG-266

Trans. of Mekhanizatsiya i Elektrifikatsiya Sotsialisticheskogo Sel'skogo Khozyaistva (USSR) nll p9-10 1971, by William R. Gill

**Abstract:** Statistical analysis of the draft force of a KPPA-2.8 combined tiller-planter showed that there was less than 5 percent variation when the machine operated in stable conditions. This is lower than when all operations are conducted separately. In that case the variation increases several times over the 'once over' operation. The combined machine creates improved agrotechnical conditions and increases in yields. (Author)

**Descriptors:** (\*Soils, Interactions), (\*Agricultural machinery, Soil mechanics), Stress analysis, Loads(forces), Statistical analysis, Translation, USSR

Identifiers: KPPA-2

FB-210 367-T NTIS Prices PC A02/MF A01

**Tracks Versus Wheels in Soft Soil and Snow**

Army Engineer Waterways Experiment Station Vicksburg Miss (038100)  
 AUTHOR Freitag, Dean R.; Janosi, Zoltan J.  
 A47311 Flid 13F, 8M, 85D GRAI7216  
 May 64 57p  
 Rept No. AEWFS-Misc Paper 4-651

**Abstract** On the basis of arguments advanced and data presented, the following points are concluded: (a) A general solution to the problem of wheels versus tracks is not feasible. (b) Whether to use wheels or tracks is a question which must be answered each time a new vehicle requirement is posed. (c) The following are the principal factors to be considered in making the decision: mission, initial cost, suspension vulnerability, obstacle performance, ridability, fuel economy, maintenance cost, and soft-soil performance. (d) Soft-soil performance is the principal factor that has motivated the selection of tracks over wheels.

**Descriptors** (Vehicle wheels, Soils). (Tracked vehicles, Snow). (Soils, Trafficability). Soil mechanics, Performance(Engineering). Correlation techniques, Tires, Weight, Penetration, Particle size, Flexural strength, Terrain, Statistical data

**Identifiers** Wheeled vehicles, Soft ground mobility, Remote areas

AD-744 222 NTIS Prices: PC A04/MF A01

**Dynamic Response of Rectangular Footings in Clay and Sand**

Army Engineer Waterways Experiment Station Vicksburg Miss (038100)  
 Final rept.  
 AUTHOR Taylor, Hugh M Jr  
 A452102 Flid 13M, 20K, 60H, 89D GRAI7215  
 May 72 111p  
 Rept No. AEWFS-TR-5-72-G  
 Project DNA WWER-SC-2100

**Abstract** The static and dynamic behavior of small-scale rectangular footings supported on the surface and buried in sand and clay specimens was determined experimentally, and the results are compared herein with dimensionless load-displacement relations previously developed for square footings. The effect of shallow depth of burial for rectangular footings in clay was found to be small for the range of parameters investigated, i.e., the nonuniform loading required to produce a given nonuniform displacement is approximately 10 percent greater for buried footings than for surface footings. (Author)

**Descriptors** (Supports, Loading(Mechanics)). (Underground structures, Foundations(Structures)). Sand, Clay, Soil mechanics, Deformation, Test methods, Radiography, Statistical data, Nuclear explosion damage, Simulation

**Identifiers** Footers, Dynamic loads

AD-743 634 NTIS Prices: PC A06/MF A01

**The Probability Nature of Variation of Draft Resistance (Veroyatnostnyy Kharakter Izmeneniya Tyagovogo Soprotivleniya)**

National Tillage Machinery Lab., Auburn, Ala.  
 AUTHOR :Prikhodkh, L. S.; Shakhvazov, D. K.; Shchupak, P. L.; Kisel'gov, Yu. Z.; Tomenko, M. P.  
 A435384 Flid 2C, 52C GRAI7212  
 22 Dec 71 7p  
 Rept No. NTML-WRG-258

Trans. of Mekhanizatsiya i Elektrifikatsiya Sotsialisticheskogo Seiskogo Khozyaistva (USSR) n7 p46-48 1971, by William R. Gill.

**Abstract:** Analysis was made of the variation of draft resistance during a number of tillage operations. Samples of 1000, 2000, 3000, 4000, and 5000 measurements were on 4000 m test sections. Readings were made every .05 sec, and when the number of samples exceeded 3000 there was a normal distribution. Limits of draft variation for the various tillage tools (P = .99) were: cultivator 290 to 1260 kg, disk tiller 0 to 1130 kg, harrow 200 to 1270 kg, seeder 770 to 2030 kg, and plows 1750 to 3930 kg. (Author)

**Descriptors** (Agricultural machinery, Soil mechanics), loads(Forces), Probability, Soils, Cutting tools, Plows, Rakes, Planting, Seeds, Statistical analysis, Translations, USSR

**Identifiers** Tillage tools

PB-209 079-1 NTIS Prices: PC A02/MF A01

**Behavior of Axially Loaded Drilled Shafts in Beaumont Clay. Part Three. Field Tests**

Texas Univ., Austin, Center for Highway Research. (388 101)

Research rept.

AUTHOR O'Neill, Michael W.; Reese, Lydon C.

A419114 F1d 8G, 12B, 64L, 60F GRA17210

Dec 70 206p

Rept No. RR-89-8-Pt-3

Project HD-3-5-65-89

See also PB-207-859.

**Abstract:** The report is part three of the eighth in a series. The principal aim is to describe the results of axial load tests of full scale, instrumented drilled shafts in the Beaumont clay formation in Houston, Texas. The tests were conducted to measure side and base stresses in cylindrical and underreamed shafts, constructed by both wet and dry procedures. Part three describes the field tests procedures and presents the detailed results of the tests.

**Descriptors:** (-Clays, -Bearing strength), (-Foundations, -Soil mechanics), Field tests, Cylindrical bodies, Axial stress, Soil mechanics, Moisture Content, Excavation, Failure, Shafts, Problem solving, Structural design, Mathematical prediction, Statistical analysis, Instruments, Texas

**Identifiers:** Beaumont Clay, Houston(Texas)

PB-207-858 NTIS Prices: PC A10/MF A01

**Pa Mong Stage One Feasibility Report. Appendix IV. Geology. Volume I**

Bureau of Reclamation, Washington, D. C. (O&R 950)

A403719 F1d 13B, 8G, 60B, 64F GRA17209

1970 271p

Monitor: TA/DST-AN-70-14-4

See also Appendix 3, PB-207-605 and Appendix 4, Volume 2, Part 1, PB-207-607

**Abstract:** The Appendix contains the geologic supporting data for the Pa Mong Stage I report. These data are largely the subsurface and surface information on foundation and construction materials obtained for use in the preparation of designs and cost estimates of engineering structures. It also contains general geologic data relevant to the water holding capability of the reservoir and geologic data related to design and construction problems anticipated during the development of the project. This Volume of the Appendix contains the text and illustrative data. (Author)

**Descriptors:** (-River basin development, Engineering geology), (-Engineering geology, Developing countries), (-Dams, Engineering geology), Geomorphology, Rocks, Economic geology.

Ground water, Minerals, Seismology, Soil mechanics, Statistical data, Laos, Thailand, Maps

**Identifiers:** \*Pa Mong project, Mekong River

PB-207-606 NTIS Prices: PC A12/MF A01

**Creep Fracture in Rock in Uniaxial Compression**

Utah Univ Salt Lake City Dept of Mechanical Engineering (402440)

Final rept., 29 Jul 70-31 Oct 71

AUTHOR: Kawasik, Wolfgang R.; Brown, Wayne S

A3862K1 F1d 8G, 64F GRA17208

Dec 71 93p

Rept No: UTIC-ME-71-242

Contract: HD110054, ARPA Order-1579

Project: ARPA OF10

**Abstract:** Three rock types, a granite, a sandstone and a marble, were tested in uniaxial compression to assess the time dependent properties of brittle rocks at stress levels exceeding half the uniaxial compressive strength. Specimens were tested in quasi-static tests and in creep and differential creep experiments at room temperature. The effect of (partial) pore water pressure was considered by comparing air-dried and water-saturated samples. Particular mathematical descriptions of time dependent deformations were derived from creep and differential creep tests. (Author)

**Descriptors:** (-Rock(Geology), Fracture(Mechanics)) Creep, Compressive properties, Brittleness, Pressure, Sandstone, Metamorphic rock, Granite, Failure(Mechanics), Porosity, Deformation, Shear stresses, Statistical data, Strain(Mechanics)

**Identifiers:** \*Rock mechanics

AD-738 002 NTIS Prices: PC A05/MF A01

**Dynamic Foundation Investigations TAA-2A Radar Site Cape Kennedy, Florida**

Army Engineer Waterways Experiment Station Vicksburg Miss (038100)  
AUTHOR Ballard, R. J. Jr.; Casagrande, D. R.  
A485244 Flid 8M, 64L GRAI7208  
Feb 67 25p  
Rept No AEWES-Misc-Paper-4-878

**Abstract** The results of vibratory tests performed at the proposed site of the TAA-2A radar facility at Cape Kennedy, Florida, indicate that shear modulus values increased from about 2700 psi near the surface to about 11,000 psi at a depth of 18 ft. Compression moduli ranged from 7500 to 28,000 psi at corresponding depths. Poisson's ratio for the upper 6 ft of soil material was about 0.40, and below 6 ft, about 0.48. Conventional and dynamic laboratory tests were also performed on soil samples obtained at the test site. These tests supplemented the in situ investigation and yielded results consistent with those of the field tests. (Author)

**Descriptors** (\*Soil mechanics, Florida). (\*Foundations(Structures), Soils). Compressive properties. Elasticity. Loading(Mechanics). Vibration. Sand. Clay. Sandstone. Classification. Moisture. Density. Structural properties. Tests. Statistical data. Radar equipment

**Identifiers** \*Cape Kennedy(Florida)

AD 737 765 NTIS Prices PC A02/MF A01

**Statistical Evaluation of Cone-Penetration-Test Data**

Army Engineer Waterways Experiment Station Vicksburg Miss (038100)  
AUTHOR Poplin, J. K.  
A368121 Flid 8M, 64L, 60M GRAI7206  
Nov 65 46p  
Rept No: AEWES-Misc-Paper-3-749  
Project: DA-T-022601-A-091  
Task: 1-T-022601-A-09102

**Abstract** The objectives of the evaluation tests were (a) To determine the statistical reliability of Cone-Penetration Resistance (CPR) data; (b) To investigate the boundary and interaction effects of penetration within the mobile-cart specimen; (c) To determine the influence of a static plate-bearing test on neighboring CPR tests; (d) To evaluate the relative uniformity of the prepared specimen.

**Descriptors** (\*Soil mechanics, Test methods). Statistical analysis. Foundations(Structures). Shelters. Model test.

**Identifiers** Cone penetration tests. Evaluation

AD-736 121 NTIS Prices: PC A03/MF A01

**Nuclear Metering of Soil Density and Moisture Content at Depth: Analysis of Measurements, Determination of Errors, and Evaluation of Ability to detect Temporal Variations in Soil Properties**

Naval Civil Engineering Lab Port Hueneme Calif (248150)

Final rept. Sep 68-Sep 69  
AUTHOR True, D. G.  
A3592F1 Flid 8M, 14B, 64L, 73D GRAI7205  
Oct 71 73p  
Rept No. NCEL-TR-742  
Project: YF38-534-002-01-002

**Abstract:** A study was conducted of the potential applicability of nuclear measuring techniques for determining soil density and moisture content at depth, and changes in these properties, for Navy civil engineering purposes. Measurements were obtained under two different types of engineering requirement to assess measurement capabilities: (1) in base material and subgrade soil beneath the pavements at five airfields, to detect long term variations; (2) in hydraulically placed foundation soils at two construction sites, both before and after densification of the soil was attempted by driving compaction piles, to detect changes due to the densification effort. The data were analyzed and statistical procedures were developed to determine the magnitudes of measurement error. Measurement errors were relatively low compared with the measured temporal variations in the soil properties at the soil densification sites, but were so large as to obscure a large portion of low-level, long-term changes occurring in the pavement subgrades. (Author)

**Descriptors** (\*Soil mechanics, \*Radiation measurement systems). Density. Moisture. Landing fields. Errors. Statistical Analysis. Probes

**Identifiers** Soil water, Soil properties, Pavement basis

AD-735 448 NTIS Prices: PC A04/MF A01

**Strain Distribution Around Underground Openings. Statistical Relationships for Certain Rock Properties**

Purdue Univ Lafayette Ind School of Civil Engineering ( 291950)

Technical rept.  
AUTHOR: Kludt, William R.; Perloff, William H.  
A358511 Fld. 8G, 20K, 13B, 64L GRA17205  
Oct 71 197p  
Rept No: TR-6  
Contract DACA73-GR-C-0002  
See also technical rept. no. 5, AD-723 532.

Abstract: Comparison is made between all possible pairs of 19 different physicommechanical properties of rocks. Useful correlation coefficients for several pairs of properties were identified. The analysis was based upon some 1,000 sets of data on 25 different rock types and included 5 different field tests and 14 different laboratory tests. The only field tests useful for predicting a laboratory test value were the propagation velocity of a longitudinal wave which gave an r to the 2nd power of 0.63 when compared to unconfined compressive strength, and the Schmidt hammer values which appeared to have reasonable correlations with wave velocities. Static shear modulus and statistically and dynamically derived moduli on laboratory specimens. (Author)

Descriptors: (Rock(Geology)), Structural properties, (Data processing systems, Rock(Geology)), Strain(Mechanics), Compressive properties, Mathematical prediction, Deformation, Underground structures, Plasticity, Correlation techniques, Statistical analysis, Shear stresses, Poisson ratio, Hardness, Porosity, Tensile properties

Identifiers: Rock mechanics, Underground openings, Finite element analysis

AD-735 376 NTIS Price: PC A09/MF A01

**Performance of Soils under Track Loads. Report 2. Prediction of Track Pull Performance in a Desert Sand**

Army Engineer Waterways Experiment Station Vicksburg Miss ( 038100)

Technical rept.  
AUTHOR: Turnage, Gerald W  
A338403 Fld. 8M, 64L GRA17203  
Nov 71 92p  
Rept No: AEWES-TR-M-71-5-2  
Project: DA-T-062103-A-046  
Task: T-T-062103-A-04603  
See also Report 1, AD-728 496

Abstract: A first-generation, quantitative description of

Straight-line track pull performance in a desert sand was sought by laboratory tests of a model track. Of 16 variables selected to provide a comprehensive description of the track-sand system, analysis of three Plackett-Burman (statistical) test designs showed four to merit initial study. (Author)

Descriptors: (Soils, Loading(Mechanics)), (Tracked vehicles, Soil mechanics), Mobility, Trafficability, Performance(Engineering), Deformation, Penetration, Interactions, Flexural strength, Test facilities, Test methods, Deserts, Model tests, Statistical analysis

Identifiers: Soil track systems

AD-733 926 NTIS Price: PC A05/MF A01

**Research in Ground Support and Its Evaluation for Coordination with System Analysis in Rapid Excavation**

Jacobs Associates San Francisco Calif (190360)

See-annual technical rept. 26 Feb-26 Aug 71  
AUTHOR: Wichham, George E.; Tiedemann, Henry R.  
A3175L4 FID 138, 86, 60H, 64L GRAI7124  
26 Sep 71 29p  
Contract HD210038, ARPA Order-1579  
Project: ARPA-1F10

**Abstract:** A method of ground support requirement prediction for rock tunnels is described. This prediction is based on the investigation of the pre-bid geology of case studies of 32 tunnel projects. A method of evaluating a rock mass structurally has been developed based on the interrelationship of 7 geologic factors. The relative evaluation of vectors are based on the geologic data obtained from the case studies. The method, called Rock Structure Rating, is a numerical value that can vary on a scale of 0 to 100. The actual ground support provided in the case studies has been evaluated by comparing the supports to a common datum. This method is called the Support Index and also varies numerically from 0 to 100. The method for correlating these factors is discussed, both as a means for refining the values of the Rock Structure Rating and for future use in predicting support requirements based on pre-bid geological investigations. (Author)

**Descriptors:** (Underground structures, Supports), (Rock(Geology), Mechanical properties), Construction, Structural properties, Economic geology, Correlation techniques, Safety, Engineering geology, Costs, Statistical data, Numerical analysis

**Identifiers:** \*Excavation, Rock mechanics

AD-732 029 NTIS Prices: PC A03/MF A01

**Penetration in Granite by Shaped Charge Liners of Various Metals**

Missouri Univ Rolla Rock Mechanics and Explosives Research Center (405518)

Final rept.  
AUTHOR: Rollins, R. R.; Clark, G. B.; Kalla, H. N.  
A2935G2 FID 8G, 19A, 19D, 64L, 79E GRA17121  
Apr 71 50p  
Rept No RMRC-TR-70-13  
Contract DACA45-69-C-0087  
Prepared in cooperation with DuPont DeMoures (E. I.) Co., Inc., Wilmington, Del.

**Abstract:** This report describes efforts to determine the penetrability of shaped charge jets into granite utilizing

metallic liners and composition C-4 as the high explosive. While shaped charges have found extensive use in military applications, industrial uses are limited to oil well casing perforations, furnace tapping, and linear metal cutting charges.

**Descriptors:** (\*Granite, Penetration), (\*Shaped charges, Cavity liners), Shaped charge jets, Detonation waves, Stagnation point, Aluminum alloys, Brass, Maraging steels, Copper alloys, Microstructure, Statistical data

**Identifiers:** Aluminum alloy 2011, Aluminum alloy 7075, Monel

AD-729 948 NTIS Prices: PC A04/MF A01

**Trafficability of Soils. Supplement No. 18: Development of Revised Mobility Index Formula for Self-Propelled Wheeled Vehicles in Fine-Grained Soils**

Army Engineer Waterways Experiment Station, Vicksburg, Miss. (038 100)

AUTHOR: Kennedy, James G.; Rush, Edgar S.  
A2694H3 FID 13F, 8L, 74F, 64K GRA17118  
Mar 68 90p  
Rept No: AEMES-TM-3-240-18-Suppl  
Project: DA-1-V-021701-A-046  
Task: 1-V-0-21701-A-046-02  
Distribution Limitation now Removed.

**Abstract:** Main test purposes were to obtain data to determine experimentally 50-pass vehicle cone indexes for some untested vehicles and from these and other test results develop an mobility indexes formula for a wide range of vehicle weights and tire sizes. (Author)

**Descriptors:** (\*Soils, Trafficability), Mobility, Indexes, Vehicles, Particle size, Soil mechanics, Tracked vehicles, Military requirements, Tires, Weight, Classification, Statistical analysis, Regression analysis, Mathematical prediction, Equations, Tables, Errors

**Identifiers:** \*Mobility index formula

AD-832 912 NTIS Prices: PC A05/MF A01

**Investigation of the Strength Properties of Frozen Soils. Fiscal Year 1952. Report of Investigations. Volume 1**

Arctic Construction and Frost Effects Lab Boston Mass (032750)

Draft rept.  
A237514 Fld. 8M, RL, 64L, 64K GRA17115  
Jun 53 135p  
Rept No. ACPEL-TR-44-Vol-1  
Project DA-86602003  
See also Volume 2. AD-712 651.

**Abstract:** The report contains the data obtained during the second consecutive year of investigational laboratory work on the strength properties of frozen soils. It is a continuation and extension of the investigational program initiated in fiscal year 1951 and reported fully in SIPRE Report 8. Investigation of Description, Classification, and Strength Properties of Frozen Soils, Fiscal Year 1951, dated June 1952. (Author)

**Descriptors:** (\*Soils, Freezing). (\*Soil mechanics, Test methods). Flexural strength, Compressive properties, Shear stresses, Elasticity, Clay, Gravel, Sand, Soil, Statistical data

**Identifiers:** \*Frozen soils

AD-725 156 NTIS Prices: PC A07/MF A01

**Effect of Organic Additives on Impregnated Diamond Drilling**

Bureau of Mines, Washington, D.C. (068 450)

Rept. of Investigations  
AUTHOR Strebig, K. C.; Aly Solim, A.; Schultz, C. W  
A2222C2 Fld fig. 8I, 13H, 71M, 64J GRA17113  
Mar 71 36p  
Rept No BM-RI-7494

**Abstract:** The effect of some organic additives in diamond drilling of quartzite was investigated in the laboratory with a drill instrumented to measure the rate of penetration, the thrust, and the torque and to record each as a function of the distance drilled. A statistical plan was followed throughout the investigation, and an equation representing the bit performance was derived from the mathematical theory of reliability. The coefficient of friction in drilling increased with the use of additives, although the wear coefficient decreased. The decrease in wear associated with an increase in energy per unit volume consumed and the increase in penetration rate resulted in a net decrease in the cost per foot of drilling. A hypothesis explaining the effects achieved with the additives is given. (Author)

**Descriptors:** (\*Additives, \*Diamond drilling), (\*Quartzites, Diamond drilling), Friction, Crack initiation, Diamond drills, Penetration, Statistical analysis, Wear inhibitors, Detergents, Glycerol, Ethylene Glycol, Water, Rock mechanics, Cooling, Efficiency, Interfacial tension

PR-198 826 NTIS Prices: PC A03/MF A01

**Influence of Lubricants and Polymer Coatings on Penetration of Oceanographic Coring Tools**

Naval Postgraduate School, Monterey, Calif. (251 450)

Master's thesis.  
AUTHOR Erchul, Ronald Anton  
A2214E2 Fld 11C, 11H, 78F GRA17113  
Dec 68 59p  
Distribution Limitation now Removed

**Abstract:** The friction developed on the inner and outer faces of oceanographic coring tubes tends to decrease penetration and gross recovered length and to increase sample disturbance. An effort was made to decrease this friction through use of lubricants and polymer coatings and to thereby increase the penetration of smooth steel surfaces into fine grained sediments. Tests were conducted in the laboratory using steel plates and an Atwood test apparatus, and at sea using gravity corers. In the laboratory tests the lubricants STP, CRC, zinc grease, and lithium grease increased penetration 46, 25, 24, and 20 percent respectively. Tests at sea showed that use of STP lubricant increased corer penetration 18 and 35 percent and gross recovery length of cores 16 percent. Statistical analysis indicated that the above increases were highly significant. Teflon, TEP film, and nylon increased penetration 20 to 30 percent in the laboratory and merit special consideration since these coatings would not contaminate the core sample. (Author)

**Descriptors:** (\*Coatings, Machine tools), (\*Drilling machines, Lubricants), Polymers, Friction, Penetration, Surfaces, Pipes, Halocarbon plastics, Statistical analysis, Nylon, Sedimentation, Contamination, Ocean bottom sampling, Greases, Soil mechanics, Theses, Shear stresses, Oceanographic equipment

**Identifiers:** Gravity corers, \*Coring

AD-R45 189 NTIS Prices: PC A04/MF A01

**Strain Distribution around Underground Openings. Comparison between Predicted and Measured Displacements**

Purdue Univ Lafayette Ind School of Civil Engineering (291950)

Technical rept.

AUTHOR: Judd, William R.; Perloff, William H.

A219412 Fld: 8G, 20K, 13B, 64L GRA17113

Mar 71 120p

Rept No: TR-5

Contract: DACA73-68-C-0002

See also technical rept. no. 4, AD-706 936.

**Abstract:** The objective of this research was to establish whether existing theoretical methods could be used to predict the amount of displacement that would occur around an underground opening during or soon after the excavation process. The first step of the study selected a finite element method of analysis based upon an elastic continuum as the most promising theoretical method. The accuracy of the predictions was analyzed by comparison with in-situ measurements of strain around as-built openings. For three of the five openings analyzed, three appeared to present no useful correlation between the magnitudes of the predicted and measured displacements; for two of the openings (Morrow Point and Green River), 75% of the cases where the displacements were in the same direction had less than an order of magnitude difference in the amount of the displacement. In general, a finite element method based upon an elastic continuum does not appear to provide an acceptable predictive method except where the rock-system behavior approximates that of an elastic continuum. (Author)

**Descriptors:** (\*Rock(Geology), Structural properties), (\*Data processing systems, Rock(Geology)), Strain(Mechanics), Underground structures, Construction, Mathematical prediction, Deformation, Elasticity, Correlation techniques, Statistical analysis, Shear stresses, Mathematical models, Computer programs, Hardness, Tensile properties

**Identifiers:** \*Rock mechanics, \*Underground openings, Finite element analysis

AD-723 532 NTIS Prices: PC A06/MF A01

**Settlement of a Pipeline on Thawing Permafrost**

Brown Univ Providence R I Div of Engineering (065310)

AUTHOR: Palmer, Andrew C.

A210413 Fld: 13B, 8L, 60B, 85B GRA17112

Mar 71 32p

Contract: SD-86

Monitor: ARPA-E77

**Abstract:** A buried oil pipeline in permafrost will thaw the

frozen soil around it, and will settle as the thawed soil consolidates. Because the amount of ice in the soil varies from point to point along the pipe alignment, the settlement will be uneven, and will induce bending in the pipe. Thaw settlement estimates from single boreholes give no information about the possible magnitude of differential settlements, and instead statistical measures of the intensity of fluctuations in thaw settlement have to be used. Alternative sources of the required data are suggested, and two different ways of estimating the effects on the pipe are described, one way being based on random process theory and the other on statistical simulation. The flexural stiffness of the pipe modifies the settlement, and methods of taking this effect into account are explained. (Author)

**Descriptors:** (\*Construction, \*Permafrost), (\*Pipes, Alignment) Bending, Networks, Petroleum, Soil mechanics, Melting, Intensity, Underground structures, Construction, Simulation, Statistical processes

**Identifiers:** \*Pipelines

AD-722 673 NTIS Prices: PC A03/MF A01

**Investigation of Description, Classification, and Strength Properties of Frozen Soils. Investigational Data Fiscal Year 1951. Volume II. Appendix B**

Snow Ice and Permafrost Research Establishment Wilmette Ill (401639)

A201442 Fld: 8M, 8L, 64L, 64K GRA17111

Jun 52 181p

Rept No: SIPRE-8-Vol-2

See also Volume 1, AD-721 745. Also available as PB-112 249.

**Abstract:** The report contains the results of an exploratory test series with tables which constitutes the initial phase of an investigational program whose purpose is to determine methods of describing and classifying frozen soils and to determine the strength characteristics of frozen soils. (Author)

**Descriptors:** (\*Soils, Freezing), (\*Soil mechanics, Graphics), Classification, Identification, Flexural strength, Structural properties, Foundations(Structures) Compressive properties, Shear stresses, Strain(Mechanics), Clay, Silt, Sand, Gravel, Ice, Statistical data, Tables

**Identifiers:** \*Frozen soils, Frost action, Peat, Graphs(Charts)

AD-721 746 NTIS Prices: PC A09/MF A01

**Investigation of Description, Classification, and Strength Properties of Frozen Soils. Report of Investigations Fiscal Year 1951. Volume I. With Appendix A**

Snow Ice and Permafrost Research Establishment Wilmette Ill (401639)  
A2014H1 Fld: 8M, 8L, 64L, 64K GRAI7111  
Jun 52 234P  
Rept No: SIFRE-8-Vol-1  
See also Volume 2, AD-721 746. Also available as PB-112 248.

**Abstract:** The report presents the results of an exploratory test series which constitutes the initial phase of an investigational program whose purpose is to determine methods of describing and classifying frozen soils and to determine the strength characteristics of frozen soils. The investigation was performed by the Frost Effects Laboratory, New England Division, Corps of Engineers, U.S. Army, for the Snow, Ice and Permafrost Research Establishment, Corps of Engineers, U.S. Army, located at Wilmette, Illinois. (Author)

**Descriptors:** (-Soils, Freezing), (-Soil mechanics, Reviews), Classification, Identification, Compressive properties, Tensile properties, Flexural strength, Shear Stresses, Test facilities, Deformation, Statistical data, Tables

**Identifiers:** \*Frozen soils, Frost action

AD-721 745 NTIS Prices: PC A11/MF A01

**A Method for Estimating Strength of Rock Containing Planes of Weakness**

Bureau of Mines, Washington, D.C. (068 450)

Rept. of investigations  
AU/IDR: Horino, Frank G.; Ellichson, Marilyn L.  
A1544A1 Fld: 8G, 8I, 64L, 64I USGRDR7105  
Nov 70 34P  
Rept No: 8M-BI-7449

**Abstract:** The report presents a method of utilizing the Coulomb strength criteria for estimating the strength and stability of pillars and pit slopes containing planes of weakness. It is assumed that the Coulomb theory, as a special case of the Mohr envelope, is a satisfactory first approximation of failure in uniaxial compression or triaxial loading with low lateral loads. Accepting this assumption for brittle materials, an expression for the strength decrease of rock pillars containing a plane of weakness or fracture at any angle of orientation is derived. As few as six samples (three solid cores and three fractured cores at a failure oriented angle) are required for testing uniaxially and triaxially to statistically determine the coefficients of friction and the shear strengths of both the solid rock and the fracture plane and the range of failure angles of the fracture plane. Plots

of either the strength or strength ratios against fracture angles obtained from oriented drill core samples gives a useful first approximation of strength decrease due to fracture. Using the same test conditions for both fractured and unfractured material increases the validity of the tests. (Author)

**Descriptors:** (-Rock mechanics, \*Fracture strength), (-Columns(Supports), Stability), (-Mining, Safety), Failure, Statistical analysis, Triaxial stresses, Loads(Forces), Mathematical prediction, Coring, Limestone, Sandstone

**Identifiers:** \*Mine pillars

PB-196 603 NTIS Prices: PC A03/MF A01

**Long Term Overturning Loads on Drilled Shaft Footings**

Texas Transportation Inst., College Station.

Research rept.  
AUTHOR: Dunlap, Wayne A.; Ivey, Don L.; Smith, Harry L.  
A1542K1 Fld: 13M, 60H USGRDR7105

Sep 70 58P

Rept No: RR-105-5F

Project: TII-2-5-67-105

Report on Design of Footings for Minor Service Structures.

**Abstract:** This report summarizes one part of a three-year study to develop a usable design procedure for drilled shaft footings subjected to all types of overturning loads. The purpose of the field and laboratory long-term loading tests was to determine what values of long-term lateral loads could be safely applied to drilled shaft footings without undue rotation, and also to develop a laboratory creep test which would aid in these predictions. (Author)

**Descriptors:** (-Footings, Loads(Forces)), Pressure distribution, Soil pressure, Bearing strength, Soil mechanics, Creep strength, Static loads, Pitch(Inclination), Statistical analysis

**Identifiers:** Drilled shaft footings, Overturning loads

PB-196 524 NTIS Prices: PC A04/MF A01

**A Dimensional Analysis of the Performance of Pneumatic Tires on Sand**

Army Engineer Waterways Experiment Station Vicksburg Miss (038100)  
 AUTHOR: Frintag, D. R.  
 A144583 F1d 13F, 8M, 79D, 64L USGRDR7104  
 Aug 66 20p  
 Rept No: AFWES-Misc-Paper-4-836  
 Project: DA-1-V-0271701-A-046  
 Task 1-V-021701-A-04603

**Abstract:** The study reported herein had a dual purpose. First, it was intended to determine, for certain specific circumstances, a mathematical relation between the various pertinent tire and soil parameters and the parameters that describe the behavior of the pneumatic tire-soil system. In particular it was desired to identify the role played by the soil in terms of relatively simple measures of the pertinent soil properties. A second purpose was to demonstrate the applicability and usefulness of dimensional analysis in experimental studies of a tire-soil system. 9

Descriptors: (\*Tires, Performance(Engineering)), (\*Sand, Traffickability), Soil mechanics, Mathematical analysis, Loading(Mechanics), Friction, Interactions, Statistical data

Identifiers: Pneumatic tires

AD-716 341 NTIS Prices PC A02/MF A01

**Ultimate Deformations of Building Foundations on Thawing Ground (O Predelnykh Deformatsiyakh Osnovaniy Sooruzheniy na Ottalvalushchikh Gruntakh)**

Cold Regions Research and Engineering Lab Hanover NH (037100)  
 AUTHOR: Usikaylov, V. P.  
 A129272 F1d 13M, 8L, 60M USGRDR7102  
 1960 17p  
 Trans. of Nauchno-Issledovatel'skii Institut Osnovaniy i Podzemnykh Sooruzheniy Spornik Trudov (USSR) n29 PRO-88 1956.

**Abstract:** The report presents a statistical analysis of deformation of various types of construction materials due to extreme temperatures encountered in Arctic regions.

Descriptors: (\*Foundations(Structures), Deformation), (\*Construction, Arctic regions), Soil mechanics, Freezing, Melting, Permafrost, Construction materials, Statistical data, USSR

Identifiers: Translations

AD 715 079 NTIS Prices PC A02/MF A01

**The Effects of Surface Roughness on the Shear Strength of Joints in Rock**

Illinois Univ Urbana (175750)  
 Final technical rept.  
 AUTHOR: Coulson, James Hilton  
 A121281 F1d 8C, 20K, 64L USGRDR7101  
 Oct 70 313p  
 Contract: DACA45-67-C-0009  
 Monitor: MRD-TR-2-70  
 Doctoral thesis.

**Abstract:** The shear strength of a discontinuity, or joint, in a rock mass is derived from two components: (1) the frictional component offered by two flat surfaces sliding relative to one another, plus (2) the geometrical component derived from the necessity of interlocking surface irregularities to be overridden or sheared off as sliding commences. The chief purpose of this investigation has been to determine the manner in which surface preparation affects the frictional component of shear strength. Flat surfaces in basalt, dolomite, limestone, sandstone, siltstone, granite, and schistone gneiss, prepared by lapping with fine no. 600 grit, by lapping with coarse no. 80 grit, and by sandblasting, have been sheared wet and dry under normal pressures from 10 to 1000 psi. To supplement test data from the flat surfaces, tests were also performed on natural joints in granite and siltstone, on joints in granite grouted with neat cement, and along intact bedding in two shales. In all, approximately 1000 shear tests were performed using a high-capacity direct-shear machine designed specifically for this testing program (Author)

Descriptors: (\*Rock(Geology), Joints), (\*Joints, Shear stresses), Surface roughness, Failure(Mechanics), Friction, Granite, Sandstone, Grout, Cements, Shale, Basalt, Limestone, Test methods, Correlation techniques, Statistical data

Identifiers: \*Rock mechanics, Siltstone, Gneiss, \*Rock joints

AD-714 244 NTIS Prices: PC A14/MF A01

**ESTIMATION OF THE ORIGINAL SHEAR STRENGTH OF DEEP SEA SEDIMENTS FROM ENGINEERING INDEX PROPERTIES**

Naval Postgraduate School Monterey Calif (251450)

Author's thesis  
AUTHOR: Hoag, Robert Wyman II  
A1054H3 Fld 8J, 8M, 64L, 78H USGRDR7023  
Sep 70 102P

Abstract Multiple linear regression techniques were employed in a statistical analysis of data from 114 deep sea cores in order to derive an equation for predicting shear strength from sediment engineering index properties. Water content, depth of burial, liquid limit, and plastic limit proved to be the only factors significantly influencing the strength in these cores. The multiple and individual correlation coefficients between these four parameters and the logarithm of shear relation. Additionally, other regression analysis were conducted to determine a water content prediction equation and to investigate correlations among other sediment properties. Water content is shown to be highly correlated with liquid limit. Ancillary to the above analysis, tests were conducted to determine the degree of reproducibility of original liquid limit values from dried sediment material. (Author)

Descriptors: (\*Ocean bottom, Soil mechanics), Regression analysis, Deep water, Shear stresses, Sedimentation, Statistical analysis, Plasticity, Thesis

Identifiers: Atterberg limits, \*Shear strength, Coring

AD-712 831 CFSTI Prices HC A06/MF A01

**INVESTIGATION OF THE STRENGTH PROPERTIES OF FROZEN SOILS. FISCAL YEAR 1952. APPENDIX A: INVESTIGATIONAL DATA. VOLUME 2**

Arctic Construction and Frost Effects Lab Boston Mass (032750)

Draft rept  
A1045K4 Fld 8M, 8L, 64L, 64K USGRDR7023  
Jun 53 220p  
Rpt No ACCEL-TR 44 Vol-2  
Project DA 85602003

Abstract The report contains tabular data describing the mechanical properties of various types of frozen soils

Descriptors: (\*Soils, Freezing), (\*Soil mechanics, Freezing), Ice, Water, Clay, Gravel, Sand, Silt, Periodic variations, Compressive properties, Shear stresses, Statistical anal.

AD-712 651 CFSTI Prices HC A10/MF A01

**FROST INVESTIGATIONS. FISCAL YEAR 1951. COLD ROOM STUDIES. VOLUME 2. APPENDIX A: EQUIPMENT AND TEST PROCEDURES. APPENDIX B: INVESTIGATIONAL DATA**

Arctic Construction and Frost Effects Lab Boston Mass (032750)

Interim rept. no. 2.  
A104504 Fld 8L, 8M, 14B, 64K, 64L USGRDR7023  
Jun 51 225p  
Rpt No. ACCEL-TR-36-Vol-2

Abstract The report, Volume 2 of 'Cold Room Studies, Second Interim Report of Investigations', includes Appendix A: 'Equipment and Test Procedures', which contains a description of the cold room and equipment and test procedures, and Appendix B: 'Investigational Data', which contains tables of test results, plots of temperature and heave versus time, and water content distribution in each sample before and after testing, for each test series. (Author)

Descriptors: (\*Permafrost, Reports), (\*Soil mechanics, Test methods), Test equipment, Soils, Statistical data, Landing fields, Pavements, Frost heave, Military requirements

Identifiers: Frost action, Graphs(Charts)

AD-712 623 CFSTI Prices HC A10/MF A01

**FROST INVESTIGATIONS 1949-1950. SUMMARY TABULATION OF AIRFIELD PAVEMENTS 1943-1949, AT AIR FORCE INSTALLATIONS CONSTRUCTED ON FROST SUSCEPTIBLE SUBGRADES**

Arctic Construction and Frost Effects Lab Boston Mass (032750)

Technical rept A1044F2 Fld 8M, 8L, 1E, 64K, 51E USGRDR7023  
Jun 50 57p  
Rept No: ACCEL-TR-32

Abstract: The report presents a summary tabulation of the pertinent data on pavements, base courses, and subgrades and on traffic histories from twenty-five Air Force bases where the pavement design is affected by frost conditions. The gross plane load evaluations of the pavements during both the normal period, where there is no weakening due to frost melting, and during the frost melting period were determined. Results of pavement condition surveys made at fifteen of the airfields are tabulated and correlated with the pavement evaluations and traffic histories. (Author)

Descriptors: (-Landing fields, Freezing), (-Freezing, Soil mechanics), Tables, Statistical data, Frost heave, Pavements, Water, Ice, Runways, Aircraft landings, Take-off, Trafficability

AD 712 591 CFSII Prices HC A04/MF A01

**FROST INVESTIGATIONS 1949-1950. REPORT OF PAVEMENT SURFACE TEMPERATURE TRANSFER STUDY**

Arctic Construction and Frost Effects Lab Boston Mass (032750)

A1044C3 Fld 8L, 1E, 20K, 64K, 51E USGRDR7023  
Jun 50 35p  
Rept No ACCEL TR-31

Abstract: The report presents the results of a study to determine the relationship between the Freezing Indexes computed using mean air temperature and those computed using pavement surface temperature. The study is based on subsurface temperature data available at the Frost Effects Laboratory consisting of periodic subsurface temperature readings throughout a complete normal freezing period from three airfields and limited readings from a fourth airfield. All located in the northern part of the United States. From these readings a factor for modifying the Air Freezing Index is obtained and applied to the theoretical equations, and a correlation made between the observed depth and predicted depth of frost penetration. (Author)

Descriptors: (-Landing fields, Freezing), (-Pavements, Heat transfer), Soil mechanics, Periodic variations, Temperature, Thermocouples, Predictions, Statistical analysis

Identifiers: \*Frost penetration  
AD-712 570 CFSII Prices: HC A03/MF A01

**DATA REPORT OF FROST INVESTIGATIONS 1943 - 1949. VOLUME III. INVESTIGATIONS IN THE GREAT LAKES DIVISION AND MISSOURI RIVER DIVISION**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
A1043G4 Fld: 8M, 8L, 1E, 64K, 51E USGRDR7023  
Jun 49 465p

Rept No ACCEL-TR-20 Vol-3  
See also Volume 2, AD-712 538.  
Reference only at DDC after original copies exhausted.

Abstract: The report is a compilation of statistical data obtained as a result of frost investigation performed on various airfields in the midwestern, northwestern United States.

Descriptors: (-Landing fields, Freezing), (-Freezing, Statistical data), Soil mechanics, Soils, Pavements, Frost heave, Water, Ice, Foundations (Structures), Trafficability, Periodic variations, Loading (Mechanics), Sampling, Wisconsin, Michigan, South Dakota, North Dakota, Nebraska, Kansas, Wyoming

Identifiers: \*Frost penetration  
AD-712 539 CFSII Prices: HC A20/MF A01

**DATA REPORT OF FROST INVESTIGATIONS. VOLUME II. INVESTIGATIONS IN THE NEW ENGLAND DIVISION**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
A1043G3 Fld: 8M, 8L, 1E, 64K, 51E USGRDR7023  
Jun 49 480  
Rept No: ACFEL-TR-20-Vol-2  
See also Volume 1, AD-712 437 and Volume 3, AD-712 539.  
Reference only at DDC after original copies exhausted.

**Abstract:** The report contains statistical data obtained from frost investigations performed on numerous New England airfields.

**Descriptors:** (\*Landing fields, Freezing), (\*Freezing, Statistical data), Soil mechanics, Soils, Pavements, Frost heave, Water, Ice, Foundations (Structures), Trafficability, Periodic variations, Loading (Mechanics), Sampling, Maine, Massachusetts

**Identifiers:** \*Frost penetration

AD-712 538 CFSII Prices: HC A21/MF A01

**FROST INVESTIGATION 1946 - 1947. REPORT ON STUDIES OF BASE COURSE TREATMENT TO PREVENT FROST ACTION**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
A1042H2 Fld: 8M, 1E, 64K, 51E USGRDR7023  
Aug 47 58p  
Rept No: ACFEL-TR-11  
See also Rept. no. ACFEL-TR-4 dated Jun 46, AD-712 359.

**Abstract:** The report presents the results of the investigations made since those reported in 'Report on Studies of Base Course Treatment to Prevent Frost Action', June 1946. It presents a study of previous investigations to determine the relationship between void ratio and the amount of salt required to prevent frost action, the results of laboratory tests to determine the effect of rock content of soils on the amount of admixture required to make them non frost susceptible, and the results of laboratory tests to determine the effectiveness of 'Darex AEA' as an admixture for preventing frost action. Representative data are presented. (Author)

**Descriptors:** (\*Landing fields, Freezing), (\*Freezing, Soil mechanics), Frost heave, Pavements, Water, Ice, Salts, Ice prevention, Test methods, Statistical data

**Identifiers:** \*Frost penetration

AD 712 493 CFSII Prices: HC A04/MF A01

**FROST INVESTIGATION 1944-1945. APPENDIX 8. REPORT ON CASPER AIRBASE, CASPER, WYOMING. APPENDIX 9. REPORT ON FARGO MUNICIPAL AIRFIELD, FARGO, NORTH DAKOTA. APPENDIX 10. REPORT ON BISMARCK MUNICIPAL AIRFIELD, BISMARCK, NORTH DAKOTA**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
A1035F3 Fld: 8L, 8M, 1E, 51E, 64K USGRDR7023  
1945 70p  
Rept No: ACFEL-TR-6-App-8/10  
See also Appendix 7, AD-712 389 and Appendices 11/12, AD-712 478.

**Abstract:** The report contains an analyses of three airfields under varying hydrological and meteorological parameters and describes the effect of frost action on existing landing strips.

**Descriptors:** (\*Landing fields, Freezing), (\*Freezing, Soil mechanics), Pavements, Frost heave, Soils, Hydrology, Water, Ice, Periodic variations, Trafficability, Statistical data, Wyoming, North Dakota

**Identifiers:** \*Frost penetration, Fargo (North Dakota), Bismarck (North Dakota), Casper Airfield

AD-712 390 CFSII Prices: HC A04/MF A01

**TREATMENT TO PREVENT FROST ACTION**

Arctic Construction and Frost Effects Lab Boston Mass ( 032750)  
A0981F3 Fld: 1E, 8L, 64K, 51E USGRDR7022  
Jun 46 55p  
Rept No: ACCEL-TR-4

**Abstract:** The report presents a summary of previous investigations performed by others, to study the effect of admixtures on frost action, in the form of excerpts from the conclusions sustained by the reports of these investigations, the results of laboratory tests performed to determine the suitability of various admixtures and combinations of admixtures to prevent frost action in materials susceptible to frost action, and the results of laboratory tests to determine whether leaching of salts could be retarded or prevented by the addition of bituminous materials. Representative data are presented herein. (Author)

**Descriptors:** (-Landing fields, Freezing), (-Freezing, Soil mechanics), Soils, Frost heave, Pavements, Water, Ice, Freezing point depressants, Sampling, Periodic variations, Thermal properties, Salts, Statistical data

**Identifiers:** Winter, Frost penetration, Leaching

AD-712 359 CFSI Prices: HC A04/MF A01

**FROST INVESTIGATION 1944-1945. REPORT ON DOW FIELD, BANGOR, MAINE**

Arctic Construction and Frost Effects Lab Boston Mass ( 032750)  
A0981G2 Fld: 1E, 8L, 64K, 51E USGRDR7022  
Jun 45 248p  
Rept No: ACCEL-TR-6-App-1

**Abstract:** The report presents the results of the frost investigation conducted at Dow Field, Bangor, Maine during the period from September 1944 through June 1945. The investigation at Dow Field includes 3 test areas in which observations were made of ground water table, frost penetration, ice segregation, water content and density, pavement bearing tests, traffic tests and foundation modulus tests were conducted. (Author)

**Descriptors:** (-Landing fields, Freezing), (-Freezing, Soil mechanics), Soils, Frost heave, Pavements, Drainage, Water, Ice, Periodic variations, Sampling, Trafficability, Statistical data, Maine

**Identifiers:** Winter, Frost penetration, Dow Airfield

AD 712 362 CFSI Prices: HC A11/MF A01

**INVESTIGATION OF THE STRENGTH PROPERTIES OF FROZEN SOILS, FISCAL YEAR 1953. APPENDIX A. INVESTIGATION DATA**

Arctic Construction and Frost Effects Lab Boston Mass ( 032750)

Draft rept.  
A0981G1 Fld: 8L, 8M, 64K, 64L USGRDR7022  
Jun 54 286p  
Rept No: ACCEL-TR-48-Vol-2  
Project: DA-8660203  
Prepared in cooperation with Corps of Engineers, Omaha, Neb. Missouri River Div. and Snow, Ice and Permafrost Research Establishment, Wilmette, Ill. See also Volume 1, AD-712 360.

**Abstract:** The report contains tabulation of mechanical properties of various types of frozen soils.

**Descriptors:** (-Soils, -Freezing), Soil mechanics, Compressive properties, Tensile properties, Shear stresses, Sampling, Ice, Frost heave, Periodic variations, Statistical data

**Identifiers:** -Frozen soils

AD-712 361 CFSI Prices: HC A13/MF A01

**FROST INVESTIGATION 1945-46. REPORT ON STUDIES OF BASE COURSE**

**FROST INVESTIGATION 1945-1946. REPORT ON FROST INVESTIGATIONS AND TRAFFIC TESTS, SELFRIDGE FIELD, MICHIGAN**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
 A0981F2 Fld. 1E, 8L, 64K, 51E USGRDR7022  
 Jun 46 109p  
 Rept No ACCEL-TR-3  
 Prepared in cooperation with Engineer Office, Detroit, Michigan.

**Abstract:** The report presents the results of the frost investigation conducted at Selfridge Field, Michigan, during the period from 31 October 1945 through 25 June 1946. The investigation includes observations of surface temperatures, subsurface temperatures, ground water table, frost penetration, ice segregation, pavement heave, water content, density and climatic conditions. Plate bearing tests were made on the pavement and base materials. Laboratory tests were performed on representative subgrade base materials and on Portland cement concrete beams and cores. The traffic tests consisted of the daily application of the specified repeated load on 2 traffic test areas during and subsequent to the frost melting period. (Author)

**Descriptors:** (-Landing fields, Freezing), (-Freezing, Soil mechanics), Soils, Frost heave, Pavements, Drainage, Water, Ice, Periodic variations, Sampling, Trafficability, Statistical data, Michigan

**Identifiers:** Winter, Frost penetration, Selfridge Airfield

AD-712 358 CFSTI Prices: HC A06/MF A01

**FROST INVESTIGATION 1945-1946. COMPREHENSIVE REPORT**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
 A0981F1 Fld. 1E, 8L, 64K, 51E USGRDR7022  
 Jun 47 159p  
 Rept No ACCEL-TR-9  
 See also Appendix 1, AD-712 356.

**Abstract:** The frost investigation program for the fiscal year 1945-1946 was conducted by the Frost Effects Laboratory in the New England Division with the cooperation of the Great Lakes Division and the Missouri River Division. Field investigations were made at nine airfields, with varying subsurface conditions, located in the northern part of the United States and laboratory studies at the Frost Effects Laboratory. This report contains a method of predicting the depth of frost penetration, based upon the properties of the soils encountered. A study of the pavement failures which were caused by frost action or to which frost action was a contributing cause is presented. (Author)

**Descriptors:** (-Landing fields, Freezing), (-Freezing, Soil mechanics), Soils, Frost heave, Pavements, Drainage, Water, Ice, Periodic variations, Sampling, Trafficability, Thermal properties, Statistical data, Maine, Wisconsin, South Dakota, North Dakota, Kansas

**Identifiers:** Winter, Frost penetration

AD-712 357 CFSTI Prices: HC A08/MF A01

**FROST INVESTIGATION 1945-1946. REPORT ON DOW FIELD, BANGOR, MAINE**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
 A0981E4 Fld. 1E, 8L, 64K, 51E USGRDR7022  
 Jun 46 101p  
 Rept No ACCEL-TR-9-App-1  
 See also Appendices 2, and 3, AD-712 353.

**Abstract:** The report presents the results of the frost investigation conducted at Dow Field, Bangor, Maine during the period from 11 October 1945 through June 1946. The investigation at Dow Field includes four test areas in which observations were made of ground water table, subsurface temperatures, frost penetration, ice segregation, water content, and density. Plate bearing tests were conducted. The climatic and other general conditions related to the frost investigation at Dow Field also are included in this report. (Author)

**Descriptors:** (-Landing fields, Freezing), (-Freezing, Soil mechanics), Soils, Frost heave, Pavements, Drainage, Water, Ice, Periodic variations, Sampling, Trafficability, Statistical data, Maine

**Identifiers:** Winter, Frost penetration, Dow Airfield

AD 712 356 CFSTI Prices HC A06/MF A01

AD 712 354 CFSTI Prices: HC A06/MF A01

**FROST INVESTIGATION 1945-1946. REPORT ON WATERTOWN AIRFIELD, WATERTOWN, SOUTH DAKOTA TARGO MUNICIPAL AIRFIELD, FARGO NORTH DAKOTA AND GREAT BEND AIRFIELD, GREAT BEND, KANSAS**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
A0981E3 Fld 1E, 8L, 64K, 51E USGRDR7022  
Jun 46 107p  
Rept No ACCEL-TR 9-App-7/8  
Prepared in cooperation with Corps of Engineers, Omaha, Neb, Missouri River Div Also includes Appendix 9. See also AD 712 357.

**Abstract:** This report presents the results of the frost investigations conducted at Watertown Airfield, Fargo Municipal Airfield, and Great Bend Airfield during the period November 1945 through May 1946. The investigations included the measurement of pavement heaving caused by frost action, the observation of subsurface temperatures, frost penetration and ground water table. The investigations include both flexible and rigid type pavements.

**Descriptors:** (-Landing fields, Freezing), (-Freezing, Soil mechanics), Soils, Frost heave, Pavements, Drainage, Water, Ice, Periodic variations, Sampling, Statistical data, South Dakota, North Dakota, Kansas

**Identifiers:** Winter, Frost penetration, Watertown Airfield, Fargo Airfield, Great Bend Airfield

AD-712 355 CFSTI Prices: HC A06/MF A01

**FROST INVESTIGATION 1945-1946. REPORT ON TRUAX FIELD, MADISON, WISCONSIN**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
A0981E2 Fld 1E, 8L, 64K, 51E USGRDR7022  
Jun 45 107p  
Rept No ACCEL-TR 9-App-4  
Prepared in cooperation with Engineer Office, Milwaukee, Wis. See also Appendices 7, 8, and 9, AD-712 355.

**Abstract:** The scope of the investigation at Truax Field included periodic test pits to determine the changes in soil conditions, observation of air and subsurface temperatures, ground water observations, measurement of frost heave and and subsidence, and field plate bearing tests. (Author)

**Descriptors:** (-Landing fields, Freezing), (-Freezing, Soil mechanics), Soils, Frost heave, Pavements, Drainage, Water, Ice, Periodic variations, Sampling, Statistical data, Wisconsin

**Identifiers:** Winter, Frost penetration, Truax Airfield

**FROST INVESTIGATION 1945-1946. REPORTS ON PRESQUE ISLE AIRFIELD, PRESQUE ISLE, MAINE AND BEDFORD AIRFIELD, BEDFORD, MASS**

Arctic Construction and Frost Effects Lab Boston Mass (032750)  
A0981E1 Fld 1E, 8L, 64K, 51E USGRDR7022  
Jun 46 138p  
Rept No ACCEL-TR 9-App-2/3  
See also Appendix 4, AD-712 354.

**Abstract:** The reports present the results of the frost investigation conducted at Presque Isle Airfield, Presque Isle, Maine, and Bedford Mass., Airfield during the period from October 1945 through June 1946. The investigation included four test areas in which observations were made of ground water table, subsurface temperatures, frost penetration, ice segregation, pavement heave, water content, and density. Plate bearing tests were conducted. The climatic and other general conditions related to the frost investigation at Presque Isle Airfield and Bedford Airfield are included in these reports.

**Descriptors:** (-Landing fields, Freezing), (-Freezing, Soil mechanics), Soils, Frost heave, Pavements, Drainage, Water, Ice, Periodic variations, Sampling, Statistical data, Massachusetts, Maine

**Identifiers:** Winter, Frost penetration, Presque Isle Airfield, Bedford Airfield

AD-712 353 CFSTI Prices: HC A07/MF A01

equations by Bernhard and Kovacs predict pile resonance in close agreement with that observed during actual pile driving. It is also suggested that these equations be subjected to a more rigorous evaluation to determine whether they can predict the resonant frequency of all force generator - column systems. (Author)

**SOIL STABILIZATION EFFECT OF MOLDING CONDITIONS ON THE EFFECTIVE STRESS-STRENGTH BEHAVIOR OF A STABILIZED CLAYEY SILT**  
Massachusetts Inst of Tech Cambridge Soil Mechanics Div (220080)

Descriptors: (+Foundations(Structures), Installation), (+Vibrators(Mechanical)), Performance(Engineering), Vibration, Resonant frequency, Shear stresses, Modulus of elasticity, Mathematical analysis, Statistical data, Soil mechanics

Phase rept no. 8 on soil stabilization  
AUTHOR: Wissa, Anwar E. Z.; Feterbaum-Zyto, Samuel; Paniarua, Jose Guillermo  
A089382 Fld 8M, 64L USGDRR7021

Identifiers: +Pile structures, +Pile driving  
AD-711 533 CFSTI Prices: HC A02/MF A01

Rept No R69-55; Soils Pub-242  
Contract DA-22-079-eng-465  
Project DA-1-T-061102-B-52-A, DA-1-T-01451-B-52-A  
Task 1-T-061102-B-52-A-01, 1-T-01451-B-52-A-00  
Monitor AFWS-CR-3-63-8

#### AN INTERPRETIVE REVIEW OF SEISMIC DESIGN METHODS

Oak Ridge National Lab., Tenn  
A066303 Fld: 18E, 8K, 77H, 64J NSA2413  
May 70 97p  
Contract W-7405-eng-26  
Prepared in cooperation with United Nuclear Corp., Elmsford, N.Y.

Descriptors: (+Nuclear power plants, Earthquake resistant structures), Seismic waves, Rock(Geology), Soil mechanics, Earthquakes, Simulation, Probability, Design

Abstract: The influence of molding water content, as-molded dry density, and delay time prior to compaction after mixing in of the molding water on the effective stress strength behavior of a clayey silt stabilized with hydrated lime and portland cement is presented in this report. This investigation used the results of high pressure consolidated-undrained triaxial compression tests with pore water pressure measurements. (Author)

DRNL TM-2900 CFSTI Prices: HC A05/MF A01

AD-711 536 CFSTI Prices: HC A07/MF A01

#### PILE DRIVING BY MEANS OF LONGITUDINAL AND TORSIONAL VIBRATIONS

Cold Regions Research and Engineering Lab Hanover N.H. (031100)

Special rept.  
AUTHOR: Kovacs, Austin, Michitti, Frank  
A0893A3 Fld: 13M, 20K, 60H USGDRR7021  
Jul 70 23p  
Rept No. CRREL-SR-141  
Project DA-1-T-062112-A-130  
Task: 1-T-062112-A-13001

Abstract: This report discusses vibratory pile driving with particular emphasis on pile driving at resonance where minimum driving efficiency can be expected. The theories and concepts associated with longitudinal and torsional pile driving are presented to show that torsional resonance does not appear to be as effective a method as longitudinal resonance and that considerable variations can exist between calculated and observed resonant frequencies. While it is pointed out that

Abstract: Previous research indicated that present accepted bituminous pavement construction does not meet specified requirements. Also on projects researched each contractor was paid 100 percent of bid price even though there was a wide range of below specification construction between jobs. A specification developed will accept construction on the basis of the average of 5 test results per LOT for nominal largest sieve, no. 4 sieve, no. 30 sieve, no. 200 sieve, AC content, compaction and thickness. Adjustment price schedules are provided for the acceptance of below standard construction. A nuclear gage correlation with densities obtained from cores is included. (BPR abstract)

Descriptors: (\*Roads, Construction materials), (\*Construction materials, Quality control), Bituminous coatings, Pavements, Specifications, Costs, Cost effectiveness, Sampling, Contracts, Statistical analysis, Soil mechanics

Identifiers: Embankments

PP 191 401 CFSTI Prices HC A07/MF A01

**STRAIN DISTRIBUTION AROUND UNDERGROUND OPENINGS. STATISTICAL METHODS TO COMPILE AND CORRELATE ROCK PROPERTIES - COMPUTER TECHNIQUES**

Purdue Univ Lafayette Ind School of Civil Engineering (291950)

Technical rept  
 AUTHOR Nahas, Patricia  
 A0385K4 Fld 8G, 20K, 13B, 64L USGRDR7014  
 May 70 140p  
 Rept No TR-4

Contract DACA73-68-C-0002  
 Supplement to Technical rept, no. 2, AD-701 086.  
 PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE

Abstract: A data tape is necessary for the storage of a systematized collection of physico-mechanical properties of rocks. Specific programs permit the obtaining of descriptive information on the data - ranges, means, and counts. Statistical routines yield histograms, scattergrams, and least squares equations. One objective is to provide information that can form the basis for some degree of uniformity in such research. Experience with the programs yielded certain principles and changes that would improve efficiency. It is recommended that one choose an efficient means of data storage, maintain a back up data source and precise records, run all descriptive programs first, process as many cases per run as possible, determine common scales where necessary for later interpretation, and label output meaningfully. (Author)

Descriptors: (\*Rock(Geology), Structural properties), (\*Data processing systems, Rock(Geology)), Statistical analysis, Underground structures, Strain(Mechanics), Computer programs, Construction, Deformation, Tensile properties, Hardness, Least squares method, Data storage systems, Modulus of elasticity, Poisson's ratio, Rupture

Identifiers: \*Rock mechanics, \*Underground openings

AD 706 936 CFSTI Prices HC A07/MF A01

**THE STATISTICAL APPROACH TO QUALITY CONTROL IN HIGHWAY CONSTRUCTION. PHASE II. DEVELOPING ACCEPTANCE SAMPLING PLANS AND PHASE III. TRIAL USE OF ACCEPTANCE SAMPLING PLANS. PART A. COMPACTED EMBANKMENTS**

North Dakota State Univ, Fargo. Engineering Experiment Station

AUTHOR Johnson, James L.  
 A0315G3 Fld 13B, 50F USGRDR7013  
 Dec 69 46p  
 Rept No Ser 17

Sponsored in part by Bureau of Public Roads, Washington, D. C.  
 See also Part A of Phase I, PB-182 285.

### STUDY OF EROSION IN ROADSIDE DRAINAGE CHANNELS IN NORTH CAROLINA

North Carolina State Univ., Raleigh. School of Engineering. (259 350)  
 AUTHOR Amein, Michael; Chu, H. L.  
 A0315F4 Fld: 13B, 8M, 60F USGRDR7013  
 Sep 69 66p  
 Prepared in cooperation with Bureau of Public Roads, Washington, D.C. and North Carolina State Highway Commission, Raleigh. Appendix to Proj. ERD-110-68-4, PB-191 397.

**Abstract** As part of an effort to establish criteria for the design of roadside drainage channels, a survey of many sites was made along the North Carolina highways. The survey consisted of measurement of the size of the contributing surface areas to the drainage, the measurement of the channel slope, the measurement of the channel cross section, identification of the surface cover, identification of points of incipient and severe erosion, identification of the extent of erosion and finally, testing of the soil samples. The soil test included sieve analysis and determination of the Atterberg limits. In addition, the location of each test site was marked on an area map. The results of this survey have been used to develop guidelines for the design of roadside channels. From these guidelines, the designer can hopefully predict whether a particular roadside channel (earth or grass) will be resistant to erosion and remain stable or whether there is a greater probability for erosion. In the latter case the use of a more resistant surface treatment such as paving would be recommended. This Appendix contains data and information which were used in the study on roadside drainage channels. (Author)

**Descriptors:** (\*Roads, Drainage), (\*Erosion, Roads), Site selection, Sampling, Soil mechanics, Stability, Statistical data, North Carolina

**Identifiers:** Ditches, \*Drainage channels

PB-191 398 CFSTI Prices: HC A04/MF A01

### STUDY OF EROSION IN ROADSIDE DRAINAGE CHANNELS IN NORTH CAROLINA

North Carolina State Univ., Raleigh. School of Engineering. (259 350)

Final rept.  
 AUTHOR Amein, Michael; Chu, H. L.  
 A0315F3 Fld: 13B, 8M, 60F USGRDR7013  
 Apr 70 55p  
 Rept No MCSU-ERD-110-68 4  
 Prepared in cooperation with Bureau of Public Roads, Washington, D.C. and North Carolina State Highway Commission, Raleigh. See also PB-191 398.

**Abstract:** An extensive field study of the performance of roadside drainage channels in North Carolina against the action of erosive forces was conducted under this research. From the results of these field observations and measurements, a criteria for the design of stable roadside channels was developed. The report presents three methods of determining whether a triangular shaped roadside drainage channel will be stable if it is fully grassed, partially grassed or bare earth when the discharge to be carried, the slope of the channel bottom, the side slope of the channel, and the soil characteristics of the channel are known. (BPR abstract)

**Descriptors:** (\*Roads, Drainage), (\*Erosion, Roads), Soil mechanics, Stability, Grasses, Pavements, Iterative methods, Statistical data, North Carolina

**Identifiers:** Ditches, \*Drainage channels

PB-191 397 CFSTI Prices: HC A04/MF A01

Statistical analysis, Classification, Drainage, Terrain, Surveying, Maps, Rural areas, Urban areas, Rock(Geology), Geologic age determination, Soil mechanics, Gravel, Sand, Tables

Identifiers: \*Appalachian Region, Land Use, Regional planning, Physiography, Soil texture

PB-191 279 CFSII Prices: HC A05/MF A01

**EXPERIMENTAL SAND DRAIN STUDY NAPA. RIVER PROJECT, MARE ISLAND 10-501-37-PM 7.1/7.4**

California State Div. of Highways. Materials and Research Dept

Final rept.

AUTHOR Smith, Travis; Weber, W. G. Jr; Shirley, Earl; Howe, D. R.; Chang, George H.

A031411 Fld 8H, 60F USGRDR7013

Oct 69 119p

Rept No M/R-63724

See also report dated Jan 66, PB-177 602. Prepared in cooperation with Bureau of Public Roads, Washington, D.C.

**Abstract** The results of a special study, involving the use of sand drains to aid the consolidation of weak compressible soils, are presented. Settlements, excess hydrostatic pressures, strength and moisture changes, instrumentation, movements, and failures are discussed. It was found that actual consolidation time lagged behind the theoretical predictions in the sand drain areas. This lag could be predicted by theoretical consideration of the disturbance caused by the displacement method of sand drain installation. High excess hydrostatic pressures, caused by the sand drain installation contributed to failure of the embankment in the sand drain area (Author)

Descriptors (-Bridges, Soil mechanics), (-Sand, Drainage), Hydrology, Soils, Underwater, Compressive properties, Pipes, Hydrostatic pressure, Permeability, Statistical data, California

PB-191 357 CFSII Prices: HC A06/MF A01

**NEW YORK STATE APPALACHIAN RESOURCE STUDIES: SOILS. PHASE 1: INVENTORY**

New York State Office of Planning Coordination, Albany.

A031383 Fld 8M, 52J, 57E USGRDR7013

1969 88p

Prepared in cooperation with Cornell Univ., Ithaca, N.Y. Dept. of Agronomy. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

**Abstract** The study of Appalachia soils provides a key to understanding the nature of the environment, explaining past and present land uses, and planning and predicting future development. The purpose is to provide information on a general soil map of the 14 counties at 1:250,000 scale (1" to 4 miles). Interpretations of the soil map, showing capabilities of the various soil areas for rural and urban uses, will be made in a subsequent publication. (Author)

Descriptors (-Soils, -New York), (-Mountains, Soils),

**PERFORMANCE EVALUATION OF WHEELS FOR LUNAR VEHICLES (SUMMARY REPORT)**

Army Engineer Waterways Experiment Station Vicksburg Miss (048100)

Final rept  
AUTHOR Freitag, Dean R.; Green, Andrew J.; Melzer, Klaus-Jurgen  
A0784J3 Fld: 22A, 3B, 84B, 85D USGRDR7013  
May 70 84p  
Rept No: AEMES-Misc-Paper-M-70-4  
See also AD-702 246.

Abstract. One pneumatic wheel, four metal-elastic wheels, and two instrumented vehicles were laboratory tested in a fine sand to determine their relative performance and to establish a better understanding of the basic principles of the interaction of very lightly loaded wheels with a soil whose properties were varied to include the probable range of lunar soil properties. Programmed-slip tests were conducted with the single wheels and the vehicles, the latter being tested on both slopes and level surfaces. Data indicate that for loads less than about 220 N (50lb), the pull/slope-climbing ability was constant for a given soil condition. At greater loads, the rate of increase in performance decreased. The effect of cohesion on performance was negligible at loads less than about 220 N (50 lb), but the effect could be seen at higher loads. The power required, in whr/km, for operation of the wheels on level and sloping soil surfaces was determined. It was demonstrated that data from single-wheel tests can be used to predict the slope-climbing ability of a vehicle, such predictions tend to be slightly conservative. Results of tests with the vehicles indicate that the torque coefficient at a given slip was not significantly affected by variations in surface slope and soil strength. (Author)

Descriptors: (\*Lunar surface vehicles, Vehicle wheels), (\*Vehicle wheels, Performance(Engineering)), Lunar environment, Simulation, Soils, Soil mechanics, Trafficability, Vehicles, Mobility, Tires, Test methods, Statistical data

Identifiers: Evaluation

AD-705 570 CFSTI Prices, HC 405/MF A01

**ROCK BREAKAGE BY PELLET IMPACT**

Ill Research Inst., Chicago, Ill. (175 350)

Final rept  
AUTHOR Singh, Madan M  
A0232C1 Fld: 8G, 20K, 911 USGRDR7012  
24 Dec 69 92p  
Contract: DOT-3-0171  
Project: IITRI-D6000

Task: D600010  
Monitor: FRA-RT-70-29

Abstract: This report discusses a study of rock breakage affected by the use of high-speed pellets. A previous study had been conducted at IITRI in which two rock types were subjected to hypervelocity impact by solid Zelux pellets as well as hollow, water-filled capsules. In this extension to the above study six rock types, viz. French Creek gabbro, Milford Pink granite, Connecticut brownstone, Minnesota dolomite, Indiana limestone, and Massillon sandstone, were investigated. The compressive strengths of these rocks range from 390 MN/square meters to 30 MN/square meters (56,900 psi to 4,400 psi). Other mechanical properties of the rocks were also determined. Craters with volumes ranging from almost negligible values to 52 cc (3.2 cu in.) were obtained. Regression equations for crater volume and crater depth in terms of the impact parameters and rock properties were determined. Impact pressures/compressive strength ratios of up to nearly 1000, with the weaker rocks, were obtained. (Author)

Descriptors: (\*Rock(Geology), Spallation), Light gas guns, Pellets, Impact, Cratering, Compressive properties, Spallation, Statistical analysis

Identifiers: \*Rock mechanics

PB-190 965 CFSTI Prices, HC A05/MF A01

Descriptors: (\*Earthquakes, Symposia), Earthquake warning systems, Earthquake-resistant structures, Microseisms, Predictions, Probability, Seismology, Seismological stations, Soil mechanics, Ocean waves, Interactions, Reports

Identifiers: Earthquake engineering

PB-189 424 CFSTI Prices: HC A03/MF A01

**SHEAR AND SLIDING RESISTANCE TESTS OF ROCK JOINTS FOR FOREBAY DAM-GRAND COULEE THIRD POWERPLANT PROJECT**

Bureau of Reclamation, Denver, Colo. Office of Chief Engineer (401 851)  
AUTHOR: Haverland, M. L.; Butler, G. L.  
7484K1 Fld: 13M, 20K, 8G, 903 USGRDR7009  
Jan 70 34p  
Rept No: REC-OCE-70-6

Abstract: Shear and sliding resistance tests were conducted in the Bureau of Reclamation laboratory and at Grand Coulee Dam, Wash. on 15- by 15- by 8-in. rock blocks to determine the apparent cohesion and sliding resistance of rock joints in the area of the Forebay Dam for the Third Powerplant. Laboratory tests utilized the 5-million-pound testing machine for the normal load and a 200-ton ram for the sliding (shearing) load. The in situ tests used a cable tensioned by a 60-ton ram for a normal load and another 60-ton ram for the sliding load. Movements were measured using displacement transducers, and were recorded continuously on x-y recorders. (Author)

Descriptors: (\*Foundations(Structures), Rock(Geology)), (\*Rock(Geology), Fracture(Mechanics)), (\*Joints, Rock(Geology)) Shear Stresses, Dams, Power Plants(Establishments), Statistical data, Loading(Mechanics), Washington(State)

Identifiers: Rock mechanics, Rock foundations, Forebay dam, Grand Coulee dam, \*Rock joints, \*Sliding resistance

PB-190 069 CFSTI Prices: HC A03/MF A01

**NSF-UCCER CONFERENCE ON EARTHQUAKE ENGINEERING RESEARCH MARCH 10-11, 1967 CALIFORNIA INSTITUTE OF TECHNOLOGY PASADENA, CALIFORNIA**

Universities Council for Earthquake Engineering Research  
AUTHOR: Berg, G. V.; Clough, R. W.; Hudson, D. E.; Newmark, N. M.  
7405H3 Fld: 8K, 13M, 911 USGRDR7008  
May 67 35p  
Prepared in cooperation with the National Science Foundation, Washington, D.C. Engineering Div.

Abstract: The primary objective of the second Conference on Earthquake Engineering Research was to bring together a group of investigators and senior research workers so that an informal interchange of ideas could occur, and basic research goals could be formulated. To this end, the Conference consisted mainly of a series of informal discussion meetings of special working groups, each under the guidance of a Chairman, assisted by a Reporter to help in the preparation of a brief report summarizing the group's deliberations. These summaries of the working group sessions are given in the present report as they were submitted by the reporters at the end of the Conference.

**STRAIN DISTRIBUTION AROUND UNDERGROUND OPENINGS. STATISTICAL METHODS TO COMPILE AND CORRELATE ROCK PROPERTIES AND PRELIMINARY RESULTS**

Purdue Univ Lafayette Ind School of Civil Engineering ( 241950)

Technical rept.  
AUTHOR: Judd, Wm. R.  
73332 Fld: 8G, 20K, 13B, 903, 911 USGRDR7007  
Dec 69 114p  
Rept No: TR-2  
Contract: DACA73-68-C-0002  
See also Technical rept. no. 3, AD-701 087.

Abstract. The collection and collation of physico-mechanical properties of rock is systematized to permit computer analysis of large quantities of such data. The main objectives of the computer codes presented here are to permit rapid retrieval of specific properties of specific rock types and to determine if two or more different rock properties can be correlated by statistical methods. Initial linear regression analyses were performed on pairs of properties, where one property was a measurement of the velocity of propagation of a longitudinal or transverse wave through a specimen or a rock system (in situ). These analyses indicate that when wave velocity is compared to impact toughness, static modulus of deformation, static modulus of rupture, unconfined compressive strength, or Young's modulus of elasticity (determined by static loading), each such pair of comparisons has a correlation coefficient greater than 0.70. It also was found that there was a 0.80 correlation coefficient between measurements of longitudinal wave velocities in laboratory specimens and in rock masses in the field. (Author)

Descriptors: (\*Rock(Geology), Structural properties), (\*Data processing systems, Rock(geology)), Statistical analysis, Underground structures, Strain(Mechanics), Programming(Computers), Earthquakes, Construction, Underground explosions, Nuclear explosions

Identifiers: \*Rock mechanics, \*Underground openings  
AD-701 086 CFSTI Prices: HC A06/MF A01

**TRACING STORMFLOW TO VARYING SOURCE AREAS IN A SMALL, FORESTED WATERSHED IN THE SOUTHEASTERN PIEDMONT**

Georgia Univ., Athens. School of Forest Resources.

Doctoral thesis  
AUTHOR: Tischendorf, Wilhelm G.  
727311 Fld: 8H, 2F, 911, 914 USGRDR7006  
1969 124p  
Monitor: W69-09740

Abstract: The existence and areal extent of subsurface stormflow was studied on a 60-acre forested watershed in the Georgia Piedmont. Between January 1967 and March 1968, 14,519 moisture readings were obtained from 42 sites on the watershed to a maximum depth of 20 feet below the soil surface. Hydrographs were separated into stormflow and baseflow by a standardized slope of 0.05 cm/hr. From 55 rain storms during the study period, 36 had stormflow volumes equal to channel precipitation, with no evidence of overland flow. The study was a unique analysis of the variability of the source area for stormflow on an entire watershed, proving that the variable source area concept is a valid representation of the rainfall-runoff relation. (Author)

Descriptors: (\*Forestry, Georgia), (\*Storms, \*Drainage), Fluid flow, Volume, Rainfall, Sources, Moisture, Soil mechanics, Regression analysis, Statistical analysis, Evapotranspiration, Theses

Identifiers: \*Forested watersheds, Ground water, Runoff  
FR-189 042 CFSTI Prices: HC A06/MF A01

**EARTHQUAKE OCCURRENCE AND EFFECTS IN OCEAN AREAS**

Wilson (Basil W.), Pasadena, Calif. (388 755)

Final rept. 28 Jun 68-31 Mar 69

AUTHOR Wilson, Basil W.

7191K2 Fld: 8K, BU, 8G, 911 USGRDR7005

Mar 69 1969

Contract N62399-68-C-0012

Project V-FD15-21-02-005A

Monitor: NCEL-Cr-69-027

Distribution Limitation now Removed.

**Abstract** Present-day concepts of the major seismic zones around the world are discussed in relation to observed features of earthquake occurrence. There is mounting evidence that vertical cellular convection of earth's mantle material is responsible for sea floor spreading about the mid-ocean ridges and for under-thrusting of oceanic crustal blocks beneath adjacent continental crusts. Earthquake activity is largely confined to the boundaries of these crustal blocks, where thrust faulting along island arcs and shear along transform or transcurent faults are proceeding. Seismicities of different oceanic regions are presented in terms of available statistics on earthquake occurrence relative to earthquake magnitude. Characteristic features of terrestrial earthquakes are reviewed, as well as known features of large submarine earthquakes, both as to tectonic movements and sea disturbances. (Author)

**Descriptors:** (\*Earthquakes, \*Reviews), Faults(Geology), Seismic waves, Ocean waves, Statistical analysis, Terrain, Motion, Damage, Acceleration, Hydrodynamics, Soil mechanics, Ocean currents, Sedimentation, Ocean bottom

**Identifiers:** Earth mantle, Ocean floor spreading, Ocean ridges, Underwater structures, Oceanic crust, Tectonics

AD B59 931 CFSTI Prices: HC A09/MF A01

**FRACTURE OF ROCK DUE TO HIGH PRESSURE, SHORT DURATION LOADINGS**

Hydronautics Inc Laurel Md (174500)

Technical rept.

AUTHOR Van Dyke, P.; Conn, A F.; Dagen, G.

6824J1 Fld 8G, 20K, 18C, 911 USGRDR6924

Sep 69 18p

Rmpt No 903-1

Contract: N00228-69-C-0409

**Abstract:** The results of a preliminary theoretical and experimental research program investigating the dynamic fracture of rock due to high pressure, short duration loadings are presented. Efforts were centered on hypothesizing a dynamic failure mechanism and verifying this model by a small

number of laboratory experiments. The model proposed is one where the statistical stress distribution accounts for the initiation of failure events and the duration of the stress determines the coalescence of these failure events into failure surfaces. The experimental program defined the regimes in which stress and geometric parameters affect the dynamic failure; very general correlation between the experiments and theory was possible. (Author)

**Descriptors:** (\*Nuclear explosions, Rock(Geology)), (\*Rock(Geology), Fracture(Mechanics)), Loading(Mechanics), Pressure, Shock waves, Failure(Mechanics), Stresses, Mathematical models, Statistical analysis, Cracks, Particle size, Microphotography, Tensile properties, Deformation

**Identifiers:** Particle statistics, Rock mechanics, Overpressure

AD 695 776 CFSTI Prices: HC A02/MF A01

**INVESTIGATION INTO THE USES OF STATISTICAL PROCEDURES IN SPECIFICATION WRITING AND QUALITY CONTROL**

Maryland State Roads Commission, Brooklandville, Bureau of Research.

Final rept  
AUTHOR: Smith, Nathan L. Jr. Parrish, A. Scott  
648344 Fld: 13B, 903 USGDR6919  
Apr 69 48p.  
Project HPR-AW-68-66-46

Prepared in cooperation with Miller-Warden Associates, Raleigh, N. C. and Bureau of Public Roads, Washington, D. C.

**Abstract:** The project demonstrated the application of several methods and techniques of statistical and statistical analysis to accepted tests of highway construction materials. The results vary widely in numerical values. Some techniques could and have been put in routine use as a result of the study. Other techniques on certain materials yielded such extreme values that the authors questioned them as being in error or the method being inappropriate. The authors concluded that there are areas where statistical control techniques are suitable for use and other areas exist where there is a need for change in statistical concepts or test methods, or both before the S.R.C. proceeds with writing and enforcement of statistically oriented specifications. (Author)

Descriptors: (\*Roads, Construction materials), (\*Construction materials, \*Quality control), (\*Specifications, Construction materials), Concrete, Soil mechanics, Cements, Asphalt, Sampling, Analysis of variance, Specifications, Test methods, Statistical tests

Identifiers: Portland cements

PB-185 049 CFSII Prices: HC A03/MF A01

**THE STATISTICAL APPROACH TO QUALITY CONTROL IN HIGHWAY CONSTRUCTION. PHASE I. MEASURING THE VARIABILITY. PART A. COMPACTED EMBANKMENTS**

North Dakota State Univ., Fargo, Engineering Experiment Station.

AUTHOR: Jorgenson, James L.  
5702L3 Fld: 13B, 8M USGDR6907  
Nov 68 43p.

Rept No: Ser-15  
Prepared in cooperation with the Bureau of Public Roads, Washington, D. C. See also Part B, PB-182 286.

**Abstract:** The work reports on measurements of variability of percent compaction and moisture content of compacted embankments on three highway grading projects, each located in a major geological area of the State. In-place random density

comparisons were made of the water balloon method, with nuclear moisture density gage in direct transmission with 6 inch probe penetration and with backscatter position readings of flush density. Flush moisture content, two-inch air gap density, and standard counts for moisture and density. (BPR Abstract)

Descriptors: (\*Roads, Construction), (\*Soils, \*Compacting), Soil mechanics, Analysis of variance, Sampling, Moisture, Density, Backscattering, Nuclear industrial applications, Non destructive testing, Quality control, Tables

Identifiers: Highways, Embankments, Nuclear moisture density instruments

PB 182 285 CFSII Prices: PC A03/MF A01

**USE OF RETARDERS WITH CEMENT TREATED SOILS**

Virginia Highway Research Council, Charlottesville.

Interim rept. no 3

AUTHOR Tice, J. A.

5634F1 Fld 8M, 118 USGRDR6906

Nov 68 36p

Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Abstract: This report presents the results of freeze thaw durability tests on soil-cement specimens to which a sugar-lime retarder has been added. Two soils, a silty sand and a silt, were used. Seven percent cement (by weight of dry soil) plus 0.375 percent sugar and 10 percent lime (by weight of cement) was added to the silty sand; 17.5 percent cement plus 0.625 percent sugar and 10 percent lime was added to the silt. Loss in compressive strength of Harvard miniature specimens after 0, 3, 6, 10, 15, 20 and 25 cycles of freezing and thawing was used to measure the relative durability of retarded and non-retarded specimens. Each cycle consisted of freezing in air at -10 degrees F for 8 hours and thawing in a moist room at 72 degrees F and 100% R.H. for 16 hours. Results of the study indicate the addition of a sugar lime retarder does not decrease freeze-thaw resistance of soil cement mixtures. (BPR Abstract)

Descriptors (\*Soils, Stabilization), (\*Cements, Soils), Additives, Soil mechanics, Freezing, Melting, Compressive Properties, Aging(Materials), Statistical analysis, Virginia

Identifiers \*Retarders

PB-192 115 CFSTI Prices PC 403/MF A01

**THE BEHAVIOR OF SATURATED FLORIDA LIMEROCKS UNDER REPEATED LOADING: PART II. FLEXIBLE PAVEMENT DESIGN**

Florida Univ., Gainesville, Engineering and Industrial Experiment Station, (139 950)

Interim rept. 1967-1968

AUTHOR Harper, F. E.

551303 Fld 17B, 8G, 20K USGRDR6904

5 Dec 68 71p

Project DR 5540, S-2-66

Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Abstract Five different Florida Limerocks were tested in a saturated condition by the Florida Limerock Bearing Ratio Test and also triaxially under static and repeated loads. (BPR abstract)

Descriptors (\*Roads, Pavements), (\*Limestone, Loading(Mechan-

ics)), Soil mechanics, Plasticity, Life expectancy, Failure(Mechanics), Compacting, Statistical analysis, Gravel, Florida

Identifiers: Graphs(Charts), Saturation

PB-180 682 CFSTI Prices: PC A04/MF A01

**COMPARISON OF OBSERVED RESISTIVITY MEASUREMENTS TO CONSTRUCTED PROJECTS**

South Dakota Dept. of Highways.

Final rept.

AUTHOR Lidel, Philip D.; Grimes, Walter W.

551302 Fld: 13M, 8G, 14B USGRDR6904

Aug 68 103p

Rept No: HP-5817(03)

Project: HPR-1(3), 608(66)  
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Abstract: A program was initiated to study data in regard to the relative significance of information derived from resistivity surveys in regard to material excavation estimates. Objectives included a determination of the relative accuracy and cost of the method as compared to conventional drilling techniques, and consideration of possible improvements in field procedures and equipment and in data interpretation. Resistivity data involved foundation studies, gravel location and hard rock estimation. (BPR abstract)

Descriptors: (\*Roads, Foundations(Structures)), (\*Soil mechanics, Measuring devices(Electrical + electronic)), Drilling, Correlation techniques, Resistance(Electrical), Sand, Clay, Gravel, Silt, Statistical analysis, Moisture, Electrical conductivity, Structural geology, Natural resources, Maps, South Dakota

Identifiers: Graphs(Charts), \*Resistivity surveys

PB-180 681 CFSTI Prices: PC A06/MF A01

**SOIL MOISTURE TENSION VARIATION ON CUTOVERS IN SOUTHWESTERN OREGON**

Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.

Forest Service research paper

AUTHOR: Mallin, William E.

550512 Fld: 2F USGRDR6904

1968 22p

Rept No: FSRP-PNW-58

Abstract: The document covers methods of estimating soil moisture tension from soil moisture content, growth, effect of silvicultural treatment on growth and response, and gives some positive steps to improve success of planting or seeding. (Author)

Descriptors: (\*Forestry, Moisture), (\*Soil mechanics, Oregon), Soils, Classification, Statistical distributions, Particle size, Analysis, Mathematical analysis, Structural properties, Physical properties, Tables, Periodic variations, Trees, Site selection

Identifiers: Soil moisture tension, Cutovers, Tree mortality

PB-180 664 CFSTJ Prices: PC A02/MF A01

**FROST SUSCEPTIBILITY OF NEW HAMPSHIRE BASE COURSES**

New Hampshire Univ Durham Dept of Civil Engineering (404121)

Supplemental rept. no. 1

AUTHOR: Leary, Robert M.; Zoller, J. Harold; Sanborn, John L.

54R202 Fld: 13B, 8M USGRDR6904

Jul 67 39p

Sponsored by New Hampshire Department of Public Roads and Highway, S. and Bureau of Public Roads, Washington, D. C. See also Supplemental rept. no. 2, AD-679 617.

Abstract: The purpose of this study was to develop procedures for simple and rapid determination of frost susceptibility of granular materials used for base courses. Methods were employed using laboratory freezing tests and correlation with physical characteristics obtained from routine engineering tests of the materials. A freezing procedure has been developed using a Peltier battery for the heat sink, cylindrical specimens in a ring type mold and a continuous supply of water to the specimen, and determining rate of heave of the specimen during freezing. Preparation and freezing of a specimen can be accomplished in approximately 48 hours. Data are presented to indicate the variation of heave rate of materials depending on grain size distribution and void ratio. (BPR abstract)

Descriptors: (\*Roads, \*Freezing), (\*Reinforcing materials,

\*Frost heave), Soil mechanics, Soils, Ice, Penetration, Cold weather tests, Deposits, Particle size, Statistical analysis, Advanced planning, New Hampshire

Identifiers: Heave rates, Evaluation, Peltier battery tests

AD-679 616 CFSTJ Prices: PC A03/MF A01

**FROST SUSCEPTIBILITY OF NEW HAMPSHIRE BASE COURSES**

New Hampshire Univ Durham Dept of Civil Engineering (404321)

AUTHOR: Biddiscombe, James F.; Zoller, J. Harold; Sanborn, John L.

54R201 Fld: 13B, 8M USGRDR6904

Jul 66 148p

Sponsored by New Hampshire Department of Public Roads and Highways, and Bureau of Public Roads, Washington, D. C. See also Supplemental rept. no. 1, AD-679 616.

Abstract: The report contains an extensive discussion of the mechanics of frost heave, based on a literature survey. The laboratory evaluation, by use of freezing apparatus developed by the U.S. Army's Cold Regions Research and Engineering Laboratory, supplemented by various physical-property tests, of unsatisfactory base course materials from three sources is also reported. The freezing tests were made on samples of: (1) unaltered material and (2) on specimens for which the normal percentage smaller than 0.02 mm. was reduced by either removing some of the material passing the No. 200 sieve or adding material retained on the No. 4 sieve. General conclusions were that: (1) some of the pavement distress in the sampled sections was not the result of detrimental frost action in the base course; (2) reduction in fines reduced the frost susceptibility of the materials; and (3) in addition to percentage smaller than 0.02 mm., gradation or particle size distribution, capillarity and permeability affect the frost susceptibility of materials, and should be further investigated. (BPR abstract)

Descriptors: (\*Roads, Freezing), (\*Reinforcing materials, \*Frost heave), Soil mechanics, Soils, Ice, Penetration, Cold weather tests, Deposits, Particle size, Permeability, Feasibility studies, Statistical analysis, Advanced planning, New Hampshire

Identifiers: Heave rates, Evaluation, Peltier battery tests

AD-679 615 CFSTJ Prices: PC A07/MF A01

**THE FLOW BEHAVIOR OF SAND AT FAILURE**

Brown Univ Providence R I Div of Engineering (065310)  
AUTHOR Weidler, Jay B.  
3411G1 Fld 138, 8M USGRDR6903  
Aug 68 68p  
Contract 5D 86  
Monitor ARPA.E59

Abstract Inferences regarding the character of the pointwise or material flow behavior for cohesionless soils are drawn from the results of a series of tests on a sand system. Specifically these inferences are that normality to the failure surface may be preserved for projections of the plastic strain increment vector onto planes of constant hydrostatic pressure (pi-planes) and that the angular deviation from normality to the failure surface for projections of the plastic strain increment vector onto planes perpendicular to the pi-plane may, as a first approximation, be considered constant. Statistical methods were employed to establish a nest of failure envelopes in the force space of the applied tractions with a parametric dependence on the relative density at failure. The results of this analysis led to the inferences regarding material behavior. (Author)

Descriptors (\*Soils, Failure(Mechanics)), (\*Sand, Soil mechanics), Hydrostatic pressure, Surface properties, Plasticity, Strain(Mechanics), Approximation(Mathematics), Statistical analysis, Density, Compressive properties, Performance(Engineering), Stresses, Civil engineering, Force(Mechanics)  
Identifiers Graphs(Charts)

AD-678 756 CFSTI Prices: PC A04/MF A01

**THE REPEATABILITY OF TEST RESULTS USING VARIOUS CALIFORNIA BEARING RATIO PROCEDURES AND THE RESISTANCE R-VALUE**

Utah State Dept of Highways, Research Section.  
5265B2 Fld 138, 20K USGRDR6824  
Aug 67 179p  
Rept No Utah RR-500 908  
Project HPR 115)  
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Abstract The purpose of this study was to compare and evaluate four of the standard methods for determining the bearing capacity of soils for highway construction and if possible draw a correlation between their results. Evaluation of the methods was based upon statistical concepts using the coefficient of variation, standard deviation and mean value. (Author)

Descriptors (\*Roads, Soil mechanics), Loading(Mechanics),

Clay, Silt, Sand, Gravel, Density, Stability, Statistical analysis, Computer programs, Flow charting, Analysis of variance, Mixtures, Feasibility studies, Compressive properties

PB-179 860 CFSTI Prices: PC A07/MF A01

**A STATISTICAL STUDY OF ROCK SLOPES IN JOINTED GNEISS WITH REFERENCE TO HIGHWAY ROCK SLOPE DESIGN. VOLUME II. APPENDICES**

Colorado School of Mines, Golden, Dept. of Basic Engineering.  
519511 Fld 138, 8G USGRDR6823  
Jul 68 148p\*  
Project: HPR-1-4  
See also Volume 3, PB-179 684.

Abstract: This volume presents detailed descriptions of the procedures used in the study and of the results of the study. These descriptions and results are given in the form of appendices to the main report PB 179 682.

Descriptors (\*Metamorphic rock, Joints), (\*Roads, Design), (\*Terrain, Stability), Structural geology, Mountains, Avalanches, Colorado, Soil mechanics, Friction, Molecular association, Regression analysis, Correlation techniques, Sampling

Identifiers: \*Highway slopes, \*Gneiss, Cohesion

PB-179 683 CFSTI Prices: PC A07/MF A01

**A STUDY OF VARIABILITY IN PRODUCTION, SAMPLING AND TESTING BITUMINOUS CONCRETE BASE. PART II. THE 1968-67 STUDY**

Maine State Highway Commission, Materials and Research Div.  
AUTHOR French, Richard; Edwards, Bryce  
5144L2 Fld 11C, 13B USGDR6822  
Sep 67 21p  
Rept No Technical paper-67-88  
Prepared in cooperation with the Bureau of Public Roads, Washington, D. C. See also Part I, PB-173 923.

Abstract This project consisted of statistically sampling an open-graded hot bituminous base mixture produced in a batch type hot-mix plant. Fifty random samples were taken at the plant site during production, and fifty samples were obtained from same loads after they were placed on the roadway and partially rolled. The 50 roadway samples should have corresponded with the 50-truck samples, but the results indicated they did not represent the same population. The roadway samples showed less fines and less asphalt than the samples taken from the trucks at the plant. (BPR abstract)

Descriptors: (\*Pavements, Bituminous Coatings), (\*Concrete, Statistical analysis), Roads, Composite materials, Tolerances(Mechanics), Soil mechanics, Mixtures, Feasibility studies, Research program administration, Collecting methods  
Identifiers: Extraction fines

PB-179 568 CFSTI Prices: PC A02/MF A01

**CORRELATION OF RAPID HYDROMETER ANALYSIS FOR SELECT MATERIAL TO EXISTING PROCEDURE LDH-TR-407-66**

Louisiana Dept. of Highways Research and Development Section  
Final rept.  
AUTHOR Bass, George W. Jr; Cryppr, Marrion M Jr  
5144G4 Fld 13R, 14B USGDR6822  
May 68 22p  
Project 67 15  
Prepared in cooperation with the Bureau of Public Roads, Washington, D. C.

Abstract: The report contains the laboratory results and statistical evaluation of a rapid hydrometer analysis as compared to the standard method of test for Mechanical Analysis of Soils. (BPR abstract)

Descriptors: (\*Roads, Soil mechanics), (\*Soils, \*Densimeters), Sampling, Particle size, Mixtures, Viscosity, Gravity, Counts, Gravel, Particles, Statistical analysis, Clay, Sand, Colloids, Silt, Accuracy, Efficiency

PB 179 590 CFSTI Prices: PC A02/MF A01

**HYDRAULIC GEOMETRY OF ILLINOIS STREAMS**

Illinois Univ., Urbana, Water Resources Center.  
Final rept. 1 Jul 66-30 Jun 68  
AUTHOR Stall, John B.; Fok, Yu-Si  
5093F4 Fld 8H USGDR6821  
Jul 68 50p  
Rept No: WRC-RR-15  
Project: B-005-ILL  
Prepared in cooperation with Illinois State Water Survey, Urbana, and Department of the Interior, Washington, D. C.

Abstract: A consistent pattern has been evaluated in which the width, depth, and velocity of flow in a stream change along the course of the stream with a constant frequency of discharge. The data from 166 stream gaging stations in Illinois have been assembled and used to develop the parameters to define the hydraulic geometry of these streams. This allows computation of the reoxygenation capacity of the stream at the problem location, and will be valuable for many purposes in water resources development. (Author)

Descriptors: (\*Hydrology, Illinois), Drainage, Rivers, Terrain Mapping, Soil mechanics, Site selection, Flowmeters, Statistical analysis, Numerical analysis, Geometry, Oxygen, Velocity, Hydraulic models

Identifiers: Biochemical oxygen demand, Aeration, Hydraulic geometry

PB-179 446 CFSTI Prices: PC A03/MF A01

**USE OF A ONE-POINT LIQUID LIMIT PROCEDURE**

National Research Council of Canada Ottawa (Ontario) Div. of Building Research (243950)

Research paper  
AUTHOR Eden, W J  
506414 Fld 8G, 8H, 8M USGDR6821  
Dec 60 13p

Rept No. RP-117  
Monitor: NRC-5599  
Availability: Pub. in American Society for Testing Materials Special Technical Publication No. 254, p168-177 1959. No copies furnished. Available from National Research Council of Canada, Ottawa (Ontario). Div. of Building Research, \$0.35

Abstract: Soil mechanics has included using a 1-point liquid limit procedure for most routine tests. The decision to use the shortened method was based on a statistical study of 300 previous tests made by 3-point method. This paper reviews the analysis of the test records available to the author along with the results of three other independent investigations on 1-point methods. After considering the variability which can be expected in the liquid limit test, the conclusion is reached that no additional significant errors are introduced through a 1-point method. A detailed 1-point test procedure is appended to the paper. (Author)

Descriptors: (\*Soils, Hydrology), (\*Soil mechanics, Test methods), Water, Drainage, Matematical prediction, Statistical distributions, Plasticity, Ions, Salts, Concentration(Chemistry), Shear stresses, Substitutes, Test equipment, Canada

Identifiers: One point liquid limit procedures

AD-674 354

**AN INVESTIGATION OF NUCLEAR METHODS OF DETERMINING MOISTURE CONTENTS AND THE COMPACTED DENSITIES OF SOILS AND AGGREGATE**

Idaho State Dept of Highways, Boise. Materials and Research Div.  
AUTHOR: Blackwell, Percy I  
480162 Fld 8M, 14B USGDR6816  
Jan 68 60p  
Project 26  
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Abstract: This report contains the results of laboratory and field testing of a portable nuclear gauge for the measuring of in-place moisture content and density of earth structures. Both laboratory and field evaluations have been directed toward determining a practical and accurate method of operation for application to construction control and

inspection. Attention was not directed toward evaluating details of machine operation, but rather on how to obtain meaningful results. (BPR Abstract)

Descriptors: (\*Roads, Soil mechanics), (\*Non-destructive testing, Moisture), Soils, Density, Measurement, Radiation measurement systems, Engineering personnel, Statistical analysis, Utah, Meters, Portable

Identifiers: Graphs(Charts), Nuclear gauges

PB-178 422 CFSTI Prices: PC A04/MF A01

**QUALITY CONTROL OF CONSTRUCTION BY STATISTICAL TOLERANCES**

Alabama State Highway Dept., Montgomery.  
AUTHOR: David, J. H.  
4795K4 Fld: 13B, 13C, 13H USGDR6816  
May 67 254p  
Rept No. HPR-29

Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Abstract: The document shows the efforts of the Alabama Highway Department to assemble data regarding statistical quality control of highway construction by examining various types of construction projects during the 1965 and 1966 construction seasons. This report reflects the effectiveness of the construction practices then in effect toward meeting the requirements of the construction specifications. Three construction projects were examined in detail. They were: (1) a grading project; (2) a base and bituminous pavement project; and (3) a base and portland cement concrete pavement project. (Author)

Descriptors: (\*Roads, Construction materials), Tolerances(Mechanics), Quality control, Construction, Asphalt, Concrete, Cements, Thickness, Composite materials, Bituminous coatings, Mixtures, Clay, Silt, Sand, Gravel, Soil mechanics, Specifications, Alabama

Identifiers: Graphs(Charts), Embankments

PB-178 477 CFSTI Prices: PC A12/MF A01

**PILE-SOIL SYSTEM RESPONSE IN CLAY AS A FUNCTION OF EXCESS PORE WATER PRESSURE AND OTHER SOIL PROPERTIES**

Texas Transportation Inst. College Station

Research rept  
AUTHOR Airhart, Tom P.; Hirsch, T. J.; Coyle, Harry M.  
467564 Fld 13M, 20K USGDR6814  
Sep 67 40p.  
Rept No. RR-33-8  
Prepared in cooperation with Texas State Highway Dept. and Bureau of Public Roads, Washington, D. C.

**Abstract:** The report concerns itself with an instrumented field test pile used to investigate the failure mechanisms which are developed in clay soils subjected to pile driving and foundation loadings. The ultimate load response of the pile-soil system was evaluated for both dynamic and static loadings. A test pile instrumented with pressure transducers, strain gages, and accelerometers was driven into a saturated clay at a site in Beaumont, Texas. Measurements of straining and acceleration of the pile were taken during driving. Pore pressure measurements were made at the pile-soil interface for a continuous period of 30 days after driving. Strain measurements were made during static load tests at 13 days and 30 days after driving. Soil borings were made for the in situ, remolded, and reconsolidated conditions and at specific radial distances from the pile. Conventional tests were conducted on the soil samples to measure the change in engineering properties for the different conditions. The most important single result of this study has been the determination of the mode of failure developed when a static pile is driven and loaded in a cohesive soil. Both static and dynamic load responses for the pile-soil system considered in this study are a function predominately of the soil properties within the region of local shear failure. The region of local shear failure is in turn a function of the pile diameter. (BPR Abstract)

Descriptors (\*Clay, Soil mechanics), (\*Foundations(Structures), Failure(Mechanics)), Pressurization, Water, Shear stress, Underground structures, Instrumentation, Statistical analysis, Dynamics, Sampling, Mechanical properties, Response  
Identifiers Piles(Structures), Pile driving

PR-177 890 CFSII Prices PC A03/MF A01

**STATISTICAL QUALITY CONTROL STUDY BASE COURSE**

South Dakota Dept of Highways  
Final rept.  
AUTHOR McDonald, E. B.; Anderson, Donald  
463544 Fld. 13B, 8M USGDR6813  
Dec 66 35

Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

**Abstract:** The purpose of this study was to establish a basis for setting future specification limits from collection of data from material analysis, to make statistical analysis of typical soil aggregate base course and to apply statistically obtained limits on a tentative basis in comparison with current specifications. Randomized samples were taken from the base courses of three widely separated projects. Determinations made for values of liquid limit, plasticity index and gradation on replicated samples. Statistical evaluation was made for variance of the material, sampling and testing. Acceptance limits of variation in the stated characteristics were tabulated. Normal distribution curves were shown for various sieve sizes and materials. The authors state that additional sampling and testing will be necessary to establish new acceptance limits as there seems to be considerable weakness between the statistically obtained acceptance limits and the existing specification limits. (Author)

Descriptors (\*Soil mechanics, \*Quality control), (\*Foundations(Structures), Soil mechanics), Roads, Construction materials, Soils, Specifications, Acceptability, Random variables, Statistical analysis

Identifiers Aggregates(Materials)

PR-177 454 CFSII Prices PC A03/MF A01

Prepared in cooperation with Bureau of Public Roads,  
Washington, D. C.

**Abstract** A statistical analysis of the cement content of cement treated base, as determined by the titration test is reported for a project on which an automatically controlled, continuously fed mixing plant was used. The test results are analyzed and compared with the results of two similar projects from a previous study. A statistical procedure for determining the value of a change in technology was employed and evaluated. This consisted of random sampling and an analysis of variance. An analysis of the amount of variance due to sampling procedure, testing error, and actual variations within the material is included and specifications for cement control limits are proposed. (BPR abstract)

**Descriptors** (\*Cementis, Foundations(Structures)), Statistical analysis, Control systems, Analysis of variance, Errors, Construction materials, Specifications, Soil mechanics, Volumetric analysis, Quality control, Roads, Sampling

**Identifiers** Aggregates(Materials)

PB-178 070 CFSTI Prices PC A03/MF A01

**PEDOLOGICAL SOIL - HIGHWAY DISTRESS STUDY HAND COUNTY - SOUTH DAKOTA**

South Dakota Dept. of Highways Physical Research Section

Final rept.

**AUTHOR** Crawford, R. A.; Anderson, D. W.

4633F2 Fld 13B, 8G USGRDR6813

1967 55p

Prepared in cooperation with Bureau of Public Roads,  
Washington, D. C.

**Abstract** The intent of the study was to relate pavement performance to soil mapping units used by the Soil Conservation Service. Ten separate construction projects on three major highway and two county roads in Hand County were examined. Fifty five mapping units were included in the ten projects. Generally, a limited correlation of performance to soil mapping units was found within projects. The age of the projects ranged from 6 to 30 years and the uncertain amount of maintenance confounded the performance ratings. The variety of surface textures strongly affected road roughness readings. Sufficiency ratings and maintenance cost records proved to be of no value in measuring performance. Engineering soil classifications proved to be of little value in rating the undisturbed soil materials. However, surface and subsurface drainage did appear to be very influential in the way the subgrade soil behaved. A drainage index was devised for rating environmental conditions and the researchers believe it will prove to be useful. The researchers believe that the measured pavement thickness (including material placed during maintenance) is a reasonable means for comparing thickess designs used in the past and evaluating present and future designs. Further evaluation of these two ratings is planned for selected sites in Brookings County. (BPR Abstract)

**Descriptors** (\*Roads, Construction), (\*Soils, Mapping), Drainage, Pavements, Soil mechanics, Performance(Engineering), Surface properties, Classification, Environment, Thickness, Design, Correlation techniques, South Dakota, Statistical analysis, Clay, Sand, Gravel

**Identifiers** Permeability, Pedological soil, Drainage index

PB-177 376 CFSTI Prices PC A04/MF A01

#### CONTROL OF CEMENT IN CEMENT TREATED BASE

California State Div. of Highways, Materials and Research Dept.

Research rept.

**AUTHOR** Sherman, George B.; Watkins, Robert O.

4632E2 Fld 13B, 13H USGRDR6813

Jan 68 30p

Rept No.: M/R-631149

**APPLICATIONS OF STATISTICAL SPECIFICATIONS FOR HIGHWAY CONSTRUCTION**

California State Div. of Highways, Materials and Research Dept  
AUTHOR: Watkins, R. O.  
4583G1 FID 13R USGRDR6812  
3 Feb 68 17p  
Prepared for presentation at the California Transportation and Public Works Conference (1968) University of the Pacific, January 31-February 3, 1968. Prepared in cooperation with Bureau of Public Roads, Washington, D C

**Abstract** A brief summary of the study titled 'Application of Statistical Quality Control Methods' in the form of a paper for presentation at a technical conference, outlining the application of statistical quality control methods for analysis of data on determination of penetration tests as asphalt, gradation of aggregate, compaction of embankments and the use of control charts of moving averages. The report does not attempt to specify frequency of sampling nor define the lot of material. The State is working towards the goal of developing more enforceable specifications.

**Descriptors** (-Roads, Construction materials), (-Construction materials, Specifications), Quality control, Reliability, Tests, Statistical analysis, Pavements, Asphalt, Trafficability, Soil mechanics

Identifiers: Highway engineering

PB-177 876 CFSII Prices PC A02/MF A01

**STUDIES OF THE KEUPER MARL PHYSICAL PROPERTIES**

Rand Research Lab., Crowthorne (England).  
AUTHOR: Marsh, A. D.  
4491L4 FID RM, 138 USGRDR6810  
1967 24p  
Rept No. RRL-LR116

**Abstract** The report describes measurements of the surface area, reflection spectra and suction properties of Keuper Marl. The correlation of these physical properties with the mineralogical analysis, chemical analysis and classification tests of the soils is discussed.

**Descriptors** (-Clay, -Soil mechanics), Physical properties, Soils, Test methods, Statistical data, Adsorption, Clay minerals, Moisture, Great Britain

Identifiers: Keuper Marl

PB-177 714 CFSII Prices PC A02/MF A01

**CLIMATOLOGICAL STUDIES**

Iowa State Univ of Science and Technology, Ames, Dept. of Agronomy

Final rept.  
AUTHOR: Shaw, Robert H.  
4491A2 FID RM, 2C USGRDR6810  
15 May 67 70p  
Contract. Cwb-11160

**Abstract** The report summarizes the developments made on the prediction of soil moisture, pointing out the apparent solutions which have been made and problems which still must be considered. The different components of the prediction technique are briefly discussed. Figures from earlier reports are reproduced in some cases to add clarity to the results and discussion.

**Descriptors** (-Soil mechanics, Climatology), (-Moisture, Soil mechanics), Agriculture, Atmospheric precipitation, Drainage, Evaporation, Dehydration, Heat transfer, Evapotranspiration, Stresses, Meteorological parameters, Periodic variations, Statistical analysis, Solar radiation, Plants(Botany), Agriculture, Water supplies, Mathematical prediction

Identifiers: Evaporimeters

PB-177 745 CFSII Prices PC A04/MF A01

**STUDY OF EMBANKMENT SETTLEMENT AND STABILITY**

Nebraska State Dept. of Roads Div. of Materials and Test.

Research study  
 AUTHOR Salberg, J R  
 4392R1 114 RM. 13R USGRDR6808  
 15 Mar 67 37p  
 Rept No 63-11  
 Project HPR 115)  
 Prepared in cooperation with Bureau of Public Roads,  
 Washington, D. C.

Abstract The design selected for stabilizing the embankment foundation required pore pressure measurements within the foundation soil during construction. In addition to pore pressure, the researchers measured settlement and horizontal displacements. Foundation soil samples were also taken and tested for shear strength. Generally, the strength of the foundation soil increased with consolidation and the engineers were able to maintain a stable condition by controlling the rate of embankment construction. The predicted amount of settlement (up to 2.75 feet) agreed closely with that measured (Author)

Descriptors (\*Soils, Stability), (\*Roads, Soil mechanics), Structural properties, Shear stresses, Statics, Statistical data, Physical properties, Sliding contacts, Mechanical properties, Lubrication, Drainage, Nebraska, Construction

Identifiers Embankments(Construction), Foundation soils

PB-177 461 CFSTI Prices PC A03/MF A01

**CHARACTERISTICS OF COMPACTED EMBANKMENTS**

Utah State Dept of Highways Research Section

Final rept  
 AUTHOR Van Houten, Frank C  
 4391D4 114 RM. 13R USGRDR6808  
 Aug 67 103p  
 Project HPR 115)  
 Prepared in cooperation with Bureau of Public Roads,  
 Washington, D. C.

Abstract The purpose of this study was to provide data for establishing statistical parameters for percent compaction of compacted embankments using the present and latest techniques in testing methods and the standardized sandcone. The parameters are to be used in evaluating existing requirements and developing new specifications. Three different embankment projects were selected for testing by three different test methods. The results were analyzed to determine the statistical parameters normally used to evaluate quality of construction. The results indicated that the three test

methods may be used interchangeably with comparable results. Factors concerning selection of the testing method must depend on availability, economics, accessibility of work, speed of testing and volume of material. (Author)

Descriptors (\*Roads, Soil mechanics), (\*Soil mechanics, Utah) . Analysis of variance, Sampling, Densimeters, Civil engineering, Construction, Construction materials, Cost effectiveness, Experimental data, Moisture, Statistical analysis, Distribution theory

Identifiers Lane-Wells Road Logger, Nuclear moisture-density gauge

PB-177 488 CFSTI Prices PC A06/MF A01

**CHARACTERISTICS OF COMPACTED BASES AND SUBBASES**

Utah State Dept. of Highways Research Section.

Final rept  
 AUTHOR Nielson, Gary F.  
 4391D3 114 RM. 13F USGRDR6808  
 Aug 67 86p  
 Project HPR 115)  
 Prepared in cooperation with Bureau of Public Roads,  
 Washington, D. C.

Abstract Three Utah Highway Department Construction projects were selected to study the characteristics of compacted bases and subbases for the establishment of new statistical parameters. The projects were selected so that the measured characteristics would cover different field conditions. The research was conducted on the base and subbase courses as they were constructed under normal operating and control methods. Statistical parameters were established for the 3 methods for determining in place density now being used in the Utah Department of Highways, the Lane-Wells Road Logger, Nuclear Chicago's Portable Nuclear Moisture-Density gauge and the Sand Cone method. The sampling or measurements were made using random selection of the sampling units.

Descriptors (\*Soil mechanics, Roads), Density, Analysis of variance, Statistical analysis, Mathematical analysis, Soils, Test equipment, Moisture, Standards, Sampling, Nuclear industrial applications, Utah

PB-177 469 CFSTI Prices PC A05/MF A01

**AN INVESTIGATION OF COMPACTION VARIABILITY FOR SELECTED HIGHWAY PROJECTS IN INDIANA**

Purdue Univ., Lafayette, Ind. Joint Highway Research Project  
AUTHOR Williamson, T. G.; Yoder, Eldon J.  
434214 Flg 13B, RM USGRDR6807  
Mar 67 116p  
Rept No 5

Project C-36-67B  
Availability Original document in color until exhausted.  
Prepared in cooperation with Bureau of Public Roads,  
Washington, D. C.

Abstract The area of study chosen for this project was compaction control of subbase and subgrade elements as used under rigid pavements. Three projects of each were selected for investigation in Indiana. The objective was (1) to gather data to determine what level of compaction was actually being achieved under present construction practices by studying the variability in compaction and the factors causing the variability; (2) to determine how a statistical quality control might be developed from these data. To assure a realistic estimate of the true level of compaction, one hundred field density tests were performed for each project by selecting ten units of construction of equal size and making five randomly replicated density tests in each. (Author)

Descriptors (\*Roads, \*Soil mechanics), Tables, Sampling, Moisture, Statistical analysis, Analysis of variance, Construction, Quality control, Test methods, Bibliographies, Earth handling equipment, Indiana, Density, Deposits

PR-177 453 CFSII Prices: PC A06/MF A01

**QUANTITATIVE TERRAIN STUDY OF VTOL LANDING SITE DISTRIBUTIONS AND OF EFFECTS ON PENETRATION**

Cornell Aeronautical Lab Inc, Buffalo N Y (098300)  
Final rept. 1 Jul 66-30 Jun 67  
AUTHOR Wood, W F.; Thung, H. L.; Lewandowski, G. M.  
408212 Flg 1B, 8F, RM USGRDR6802  
30 Jun 67 125p  
Rept No CAL VE 2703-D  
Contract AF 33(615)-7483  
Monitor ASD-TR 67-18

Abstract A VTOL site is assumed to require a ground slope of 10% or less and be clear of trees. Also there can be no boulders over 2 feet high or gullies deeper than 2 feet. Single sites, if square, should be 200 feet on a side and if circular 250 feet in diameter. Assault sites, if square, should be 1500 feet on a side and 2000 feet in diameter if circular. Probability distributions of distances to single and assault sites, based on a study of environmental literature, topographic maps and aerial photographs are

presented for Thailand, India, Nevada, Italy, Germany and Alaska. A VTOL site may be expected within a few miles in all but the most unfavorable environments. Sites located on residual soils would seldom be too soft for VTOL operations, but alluvial soils should be avoided when poorly drained. Prior knowledge of analogous situations, aerial photography and direct observation provide the best information for evaluating candidate sites. (Author)

Descriptors (\*Aircraft landings, \*Terrain), (\*Vertical take-off planes, Aircraft landings), Distribution, Landing fields, Site selection, Probability, Maps, Soil mechanics, Aerial photography, Alaska, Thailand, India, Nevada, Italy, East Germany, West Germany, Trafficability, Penetration

AD 661 592 CFSII Prices: PC A06/MF A01

**ANALYSIS OF ESTIMATED RIVER EXITING PERFORMANCE**

Detroit Univ Mich Dept of Civil Engineering (402845)

Technical rept.  
 AUTHOR Sloss, D. A.; Baker, W. J.; Lassaline, D. M.; Miranda,  
 C. V. C. F.

3723CT Fld 13U USGRDR6719  
 Jul 67 72P  
 Contract DA 20 113 AMC-09099(7)  
 Monitor LI 115

**Abstract** A previous study of river magnitude and frequency established river exiting as the primary problem for vehicles attempting to cross rivers. Analysis of the exiting problem indicated that the single most important parameter to be considered was the geometric form of the river bank. Evaluation of the probability of an M-113 exiting at each bank surveyed in the magnitude and frequency study was made by relating vehicle performance characteristics to bank descriptions; a determination of the probability of the vehicle exiting was then made on a GO or NO-GO basis. Since much of the environment was extremely severe with respect to M-113 capabilities, this evaluation was fairly straightforward. A numerical method, using a geometric severity to classify bank geometry, was then developed to permit a performance analysis to be conducted on a rational basis. (Author)

**Descriptors** (-Armored vehicles, Performance(Engineering), (-Rivers, Terrain), Soil mechanics, Analysis, Maneuverability, Probability, Numerical methods and procedures, Geometric forms, Armored vehicles, Passenger vehicles

Identifiers M 113 vehicles

AD 656 E07 CFSTI Prices PC A04/MF A01

**A COMPARISON OF CLAY CONTENTS DETERMINED BY HYDROMETER AND PIPETTE METHODS USING REDUCED MAJOR AXIS ANALYSIS**

Illinois Univ., Urbana, Soil Mechanics Lab.

Soil Mechanics Series  
 AUTHOR Liu, Thomas K.; Odell, Russell T.; Etter, William J.; Thornburn, Thomas H.

363103 Fld 8M USGRDR6717

Feb 67 6P  
 Rept No SMS-71  
 Project SMS-12  
 Monitor 1R

**Availability** Hard copy available from Soil Science Society of America, Columbus, Ohio, \$3.00. Prepared in cooperation with Bureau of Public Roads, Washington, D. C. Published in Soil Science Society of America Proceedings v30 n6 pp 1011-1013 Nov-Dec 1966

**Abstract** Test results on the amount of <0.002 mm clay determined by hydrometer and pipette methods have been obtained from 155 duplicate soil samples, of which 48 are from Illinois and the remaining 107 are from soil survey reports published by the Soil Conservation Service in cooperation with 10 other States. Correlation analysis of the data yielded a highly significant coefficient of 0.965. The best-fit line between the clay contents determined by these two procedures was obtained by the reduced major axis method of statistical analysis. In this statistical method, neither one of the two variables is considered as the dependent variable and the reduced major axis is determined by minimizing the sum of the areas of triangles formed by lines drawn from each point to the best-fit line and parallel with the X and Y axes. The relationship between the clay contents is expressed by the equation  $y = 0.63 + 1.008x$ , in which X and Y represent the pipette and hydrometer clay content, respectively. Clay contents determined by these two methods are quite similar, although there is a tendency for hydrometer analyses to be slightly higher. Relationships between data from Illinois and other States are very similar. The slightly poorer correlation between clay contents of A horizons as compared to other horizons may have been caused by organic matter which was not removed in hydrometer analysis. (Author)

**Descriptors** (-Clay, Soil mechanics), (-Chemical analysis, -Densimeters), Pipettes, Soils, Particle size, Equations, Statistical analysis, Tables, Errors, Regression analysis, Tests

PB 174 953 CFSTI Price MF A01

**QUALITY CONTROL ANALYSIS. PART II. SOIL AND AGGREGATE BASE COURSE**

Louisiana Dept. of Highways Research and Development Section

Research rept  
AUTHOR Shah, S. C.  
3002FA Fld 13C, 13R USGRDB6706  
Jul 66 42P  
Rept No. RR 23  
Project 63 1G  
Monitor 18  
Research supported in cooperation with Bureau of Public Roads, Washington, D. C.

**Abstract** The report concerns quality control analysis of highway construction materials. It deals with the statistical evaluation of results from several construction projects to determine the basic pattern of variability with respect to certain base course characteristics. On the basis of this variability, numerical limits have been established using statistical quality control techniques. The analysis indicated (1) that the frequency distribution of historical data for most of the characteristics tend to follow normal distribution; (2) that the variability for compaction and thickness is considerably different for different contractors; (3) that this variability for compaction is more pronounced for cement stabilized aggregate base course than for stabilized soil cement course; (4) furthermore, that for raw or unstabilized aggregate base course, the variability is less than that for stabilized base course. (Author)

**Descriptors:** (+Construction materials, Quality control), Roads, Soils, Statistical analysis, Soil mechanics, Specifications, Identifiers, Aggregates(Materials)

PR-173 925 CFSTI Prices PC A03/MF A01

**A STATISTICAL ANALYSIS OF EMBANKMENT COMPACTION**

California State Div of Highways, Materials and Research Dept

Research rept.  
AUTHOR Sherman, George B.; Watkins, Robert O.; Prysock, Robert H.  
3001GI Fld 8M, 13R USGRDB6706  
Jan 67 80P  
Rept No. M/R-631133 3  
Monitor 18  
Presented at the Annual Meeting of the Highway Research Board (46th), January 1967. Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

**Abstract:** The study statistically examined the distribution of percent relative compaction obtained with current compaction control procedures used in Calif. on three embankment projects where the soils varied from homogeneous to vary heterogeneous material. Analysis of percent relative compaction results revealed average values of 92.9, 90.5 and 93.5 percent with standard deviations of 2.4, 3.1 and 5.5 percent respectively. The greatest dispersion in results was found with the heterogeneous soil. The distribution curves of percent relative compaction agreed generally with those reported by the U. S. Bureau of Reclamation and the AASHTO Road Test. Factors contributing to the dispersion of percent compaction were found to be testing procedure, the soil, and in the compaction process. Curves are presented which provide a comparison of field control test results and randomly sampled test results. A partial review of problems expected to be encountered in the development and use of purely statistical specifications is presented. (Author)

**Descriptors:** (+Soil mechanics, Roads), Statistical analysis, Graphics, Foundations(Structures), California, Soils, Specifications

PB 173 909 CFSTI Prices: PC A05/MF A01

Descriptors: (\*UNDERGROUND EXPLOSIONS, MATHEMATICAL ANALYSIS), (\*NUCLEAR EXPLOSIONS, UNDERGROUND EXPLOSIONS), (\*EXPLOSIONS, THEORY), SURFACE BURST, SOILS, SOIL MECHANICS, STRAIN (MECHANICS), STRESSES, STATISTICAL MECHANICS, INTEGRAL EQUATIONS, MATRIX ALGEBRA

**SHEAR PHENOMENA IN GRANULAR RANDOM PACKINGS**

Princeton Univ N J School of Engineering and Applied Science (000000)

Identifiers: JANGLE OPERATION

AD-608 885 CFSTI Price: PC A02

Scientific rept. no. 2  
AUTHOR: Herbst, Thomas F.; Winterkorn, Hans F.  
186313 USGRD6518  
30 May 65 2p  
Rept No: SERP-2  
Contract: AF19 628 2414  
Project: 7628  
Task: 762804  
Monitor: AFCRL-65-370  
See also AD-436 458

Abstract: The results are presented of a research project on the mechanical resistance properties and behavior in deformation of macro-particle systems in the light of the theory of the macro-meritic solid, liquid and solution states. A critical analysis and appraisal is made of what goes on in the shear process as a result of design and working features of the test apparatus, as well as of intrinsic properties of the granular system that is under test. The results of this analysis are utilized for the design of a semiautomatic direct shear tester. The historical development of our understanding of the shear process in molecular and macro-meritic systems is traced and an indication is given of how thermodynamic and kinetic-statistical concepts can be fruitfully employed in this continued quest.

Descriptors: (\*Soils, Shear stresses), (\*Shear stresses, Soil mechanics), Mechanical properties, Sand, Gravel, Solids, Liquids, Solutions, Internal friction, Thermodynamics, Deformation, Statistical analysis, Test methods

AD-619 398 CFSTI Prices: PC A02/MF A01

**UNDERGROUND EXPLOSION THEORY**

California Univ Berkeley (000000)  
AUTHOR: Morrey, Jr., C. B.; Pinney, Edmund; Stoneham, R. G.;  
Chambre, P. L.; Lakness, R. M.  
1455K2 USGRDR  
Apr 52 2  
Contract: Nonr22204  
Project: NR340 040, 1 9  
Monitor: WT-369  
Rept. on Operation JANGLE, Nevada Proving Grounds, Oct-Nov 51.  
Declassified 11 Jan 59.

Abstract: Contents: Theoretical studies of the shock wave; Application of the Kirkwood-Brinkley method to the theory of underground explosions; Notes on surface and underground explosions; Predictions for the underground shot.

NSMS p1-13 Oct 1959.

**A BASIC STUDY OF THE NUCLEAR DETERMINATION OF MOISTURE AND DENSITY**

California State Div. of Highways,  
0584K3 Fld. RM. 13B, 18D USGRDR4120  
Nov 65 152p  
Rept No. MR-225928; STS 0421  
Monitor 18

Prepared in cooperation with the Bureau of Public Roads,  
Washington, D. C.

Abstract: A laboratory project was undertaken to study factors effecting the results obtained by using nuclear gauges to determine soil moisture and density. Both backscatter and transmission type nuclear soil density gauges were studied. The study consisted of conducting readings on laboratory compacted soil samples, using six different soil types. Tests indicate that the compacted soil samples had a soil density variation with a standard deviation of about two pounds per cubic foot. The density calibration curves obtained by nuclear methods indicate a standard deviation of 4 1/2 pounds per cubic foot for the backscatter, and 2 1/2 pounds per cubic foot for the transmission type gauges. By collimation of the source the standard deviation of the backscatter type gauge calibration was reduced to 2 1/2 pounds per cubic foot. The readings obtained with backscatter type gauges were very sensitive to surface roughness while the transmission type gauges were only slightly effected by surface roughness. The volume of the soil affecting the nuclear readings was determined to be about 0.05 cubic foot for both the backscatter and transmission type gauges. There were indications that the transmission gauges are more desirable for determining soil density than the backscatter type gauges. The moisture readings were much less affected by the various items, such as surface roughness, than the density readings were. The standard deviation of the moisture readings was about one and one-half pounds of water per cubic foot.

Descriptors: (\*Soil mechanics, Test methods), (\*Radiation measurement systems, Soil mechanics), Probes, Effectiveness, Densimeters, Hygrometers, Density, Moisture, Measurement, Statistical distributions, Surface properties, California

PB-172 991 CFSJI Prices PC A08/MF A01

**A STATISTICAL STUDY OF SOIL SAMPLING**

Illinois Univ., Urbana (175 750)  
AUTHOR Thorburn, Thomas H., Larsen, Wesley R  
0581B4 Fld RM. 13B USGRDR4119

Oct 59 14p  
Rept No Soil Mechanics Ser. 2  
Monitor 18  
Pub. in Journal of the Soil Mechanics and Foundations I  
Proceedings of the American Society of Civil Engineers

Abstract A study was undertaken to determine the number of samples needed to obtain reasonable correlations between pedologic soil types and their engineering properties. Data from four DeWitt County soils give a quantitative indication of the value of pedologic information in planning, designing and constructing highways and airports in Illinois. (Author)

Descriptors: (\*Soils, Sampling), Soil mechanics, Statistical analysis, Liquids, Plasticity, Clay, Statistical tests, Roads, Airports, Illinois

PB-172 861 CFSJI Prices PC A02/MF A01

the conduct of a detailed soil survey for transportation facilities based on the use of simple statistics. The suggested method distributes the number of borings in accordance with the size of area along the proposed alignment occupied by each type of surficial soil as well as with its relative variability in engineering properties. (Author)

Descriptors: (\*Soils, Sampling), (\*Roads, Soils), Statistical Analysis, Distribution, Soil mechanics, Illinois  
PB-172 863 CFSTI Prices: PC A02/MF A01

**ENGINEERING SOIL REPORT, LIVINGSTON COUNTY, ILLINOIS**  
Illinois Univ., Urbana. Engineering Experiment Station. (176 050)  
AUTHOR: Thornburn, Thomas H.; Morse, Robert K.; Liu, Thomas K. 057544 FID 8M, 138 USGRDR4119  
26 May 65 166p  
Rept No EES-Bull-482; 0143  
Monitor: 18  
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Abstract: The report shows the relation between pedologic soil types, parent materials and engineering properties. By using the information contained in this report, an engineer can predict the engineering properties of the soils of any area in Livingston County with a fairly high degree of accuracy. Test data obtained from sampling sites in the county are summarized by soil types on data sheets. In addition, each data sheet contains a description of each soil profile, its average characteristics and an engineering analysis. The geology and pedology of the county are described as well as various statistical concepts used in making comparisons of the soil mapping units by grain size, plasticity characteristics, and moisture-density relationships. The uses that can be made of the tabulated data are discussed with regard to preliminary planning for highway locations, preliminary reconnaissance, detailed surveys and construction problems. The report is designed to be used in conjunction with maps previously published as a part of a University of Illinois Agricultural Experiment Station report entitled, Livingston County Soils.

Descriptors: (\*Soil mechanics, Illinois), (Illinois, Soils), Distribution, Statistical analysis, Particle size, Physical properties, Geology  
PB-170 870 CFSTI Prices: PC A08/MF A01

**ENGINEERING INDEX PROPERTIES OF SOME SURFICIAL SOILS IN ILLINOIS**  
Illinois Univ., Urbana. (175 750)

Illinois Cooperative Highway Research Program Series no. 31.  
AUTHOR: Liu, Thomas K.; Thornburn, Thomas H. 0575H2 FID 8M, 138 USGRDR4119  
1966 147p  
Rept No Bulletin-477  
Project: IHR-12  
Monitor: 18

Abstract: From 120 sites in nine different counties in Illinois, soil samples were obtained with an auger from the A, B and C horizons of ten soil types of the Humic-Gley great soil group. These samples were subjected to classification tests. On the basis of statistical analysis of six index properties (liquid limit, plasticity index, percent finer passing sieve nos. 20, 40 and 200, and per cent clay < 2 microns), it was found that the variability of each soil type depends on not only the character of the parent material but also the profile characteristics defined by the pedologist. Furthermore, from the engineering standpoint, these soil types cannot be grouped together by using the geological origin of the parent material alone; they can, however, be grouped together by the character of parent material. The grain size test results obtained by sieve and hydrometer analyses indicate that approximately 60% of the samples tested have the modal texture of the typical soil types according to the United States Department of Agriculture Textural Soil Classification System. (Author)

Descriptors: (\*Soil mechanics, Classification), (Illinois, Soils), Statistical analysis, Standards, Sampling, Plasticity, Particle size, Clay, Indexes  
PB-172 865 CFSTI Prices: PC A07/MF A01

**STATISTICALLY CONTROLLED ENGINEERING SOIL SURVEY**  
Illinois Univ., Urbana. (175 750)

Illinois Cooperative Highway Research Program Series no. 37.  
AUTHOR: Liu, Thomas K.; Thornburn, Thomas H. 0575F4 FID 8M, 138 USGRDR4119  
Jan 65 15p  
Rept No: Soil Mechanics Ser-9  
Monitor: 18

Abstract: It has been recognized that making soil borings at regular intervals along the proposed line of right-of-way for a transportation route is not the most satisfactory procedure for an engineering soil survey, since the relative degree of variations in the properties of natural soil units encountered has not been considered. The paper proposes an approach to

**DISTRIBUTION AND ENGINEERING PROPERTIES OF NORTH CAROLINA SOILS**

North Carolina State Univ., Raleigh. School of Engineering (259 350)

Final rept  
AUTHOR: Wahls, H. E.; Buchanan, W. T.; Futrell, G. E.; Lucas, S. P.

057382 Fld: 6M, 13B USGRDR4119

Jun 64 128p

Rept No: 0192

Project: ERD-110-W

Monitor: 18

Prepared in cooperation with North Carolina State Highway Commission and Bureau of Public Roads, Washington, D. C.

Abstract: A study was made of the feasibility of correlating engineering properties and classification systems with existing pedological and geological soil classification systems. The residual soils of a 14-county area in the North Carolina Piedmont were used for the study. Classification and compaction test data are presented for 20 predominant pedological soil series in the study area. Statistical means and standard deviations of the test results are given for both the B and C horizons of each series. The probable reliability of each mean value as a measure of the true mean for the population is also given. Correlations among various properties of individual samples were studied. Linear relations are presented for plasticity index versus liquid limit, plasticity index versus clay fraction and dry density versus liquid limit. Although measurements of penetration resistance are also presented for soils in situ and samples compacted and soaked, the report concludes that no relation was found for penetration resistance and any other soil property. (Author)

Descriptors: (\*Soil mechanics, North Carolina), (\*North Carolina, Soils), Distribution, Mechanical properties, Statistical analysis, Plasticity, Clay, Penetration, Particle size

PB-172 893 CFSTI Prices PC A07/MF A01

**ON THE STATISTICAL PROPERTIES OF THE GROUND CONTOUR AND ITS RELATIONS TO THE STUDY OF LAND LOCOMOTION**

Army Tank Automotive Center, Warren, Mich. Land Locomotion Lab.

AUTHOR: Bogdanoff, J. L.; Kozin, F.

049441 Fld: 6M USGRDR4115

Mar 62 42p

Rept No: 7823; LL-7A

Project: 5510 11-R22, DA-570-05-001

Monitor: 18

Abstract: In this report statistical models of the ground surface contour are considered along with possible forms for the two dimensional power spectral density. The advantages and disadvantages of the models are pointed out. Perturbations in the power spectral density of the surface are studied to determine the magnitude of their effect on an optimum criterion chosen for vehicle parameter studies. Finally, the power spectral densities from an actual ground surface survey are presented and discussed.

Descriptors: (\*Statistical analysis, Soil mechanics), (\*Soil mechanics, Statistical analysis), Trafficability, Roads, Vehicles, Terrain

AD-402 334 CFSTI Price: PC A03

## ON THE STATISTICAL ANALYSIS OF LINEAR VEHICLE DYNAMICS

Army Tank Automotive Center, Warren, Mich. Land Locomotion Lab.

Author: Bogdanoff, J. L.; Kozin, F.  
 0492J3 F1d: 8M, 13F USGRDR4115  
 Mar 62 59p  
 Rept No. 7824, LL-73  
 Project 5510 11-822, DA-570-05-001  
 Monitor: 18

Abstract: Statistical analyses of the dynamics of some two-dimensional linear vehicles traveling on a rough track are performed to determine the influence on two aspects of vehicle ride of a set of parameters which include wheel base length, idealized tire imprint length, speed, and damping constant. It is assumed that the vehicles move with constant horizontal velocity on a second order, weakly stationary and mean square continuous random track with contact maintained at all times between the idealized tires and the track. The two aspects of vehicle ride used as measures of the ride roughness are peak value of power spectral density and variance of frame acceleration, the frame acceleration being either vertical at the c. g. of frame, vertical at the point over idealized wheel, or angular (pitching). For the same speed, damping, power spectral density for the track, and two particular vehicles, the idealized tire imprint length was a relatively unimportant parameter over a fairly large range of values. In the other hand, one parameter which included the wheel base length was found to be important under the same conditions. Four sets of parameter values were found which at the same speed produced best or optimal rides for vertical acceleration at the frame c. g. and over the wheel, depending upon which measure of ride roughness was employed. The influence of speed was then examined on vehicles having these sets of parameter values. In all cases, increasing speeds produced sharp increases in ride roughness. (Author)

Descriptors: (Statistical analysis, Soil mechanics), (Vehicles, Dynamics), Linear systems, Trafficability, Modelling theory

AD 400 391 CFSTI Price PC A04

## A PERFORMANCE INVESTIGATION OF PILE DRIVING HAMMERS AND PILES

Michigan State Highway Commission, Lansing

Final rept  
 040513 F1d: 17B, 13I, 13M USGRDR6611  
 Mar 65 342p  
 Rept No. 0112  
 Project 61 F 60  
 Prepared in cooperation with Bureau of Public Road, Washington, D. C., Michigan Road Builders Association, Wayne State Univ. and Representative Hammer Manufacturers. See also

PB-169 840, PB-169 841.

Abstract: An experimental study of field pile driving operations was made in Michigan which tested air-, steam-, and diesel-powered pile driving hammers on piling of various configurations at sites selected to represent a varied range of soil conditions. Hammer performance was recorded by conventional methods and also through electronic transducers for experimental determination of force, acceleration, and deflection. Resulting data were evaluated and compared in terms of blow count, pile penetration rate, and 'enthrus' (net energy delivered to the pile top). Selected piles also underwent extensive static loading tests. From data obtained, measured pile supporting capacity was correlated with that estimated from soil boring data secured prior to pile driving. Eleven common dynamic pile formulas were analyzed in light of this correlation of estimated and measured pile capacity. Guidelines are presented for selection of hammers and for good pile driving practice. (Author)

Descriptors: (Hammers, Performance(Engineering)), (Structural parts, Foundations(Structures)), (Roads, Civil engineering), Michigan, Soil mechanics, Experimental data, Statistical analysis, Machine tools, Pipes, Loading(Mechanics), Soils, Force(Mechanics), Penetration

PB-169 839 CFSTI Prices: PC A15/MF A01

APPENDIX D: COMPENDEX (FILE 8)

were performed on a group of as-compacted samples to investigate the compressibility behavior and the compactive prestress induced in the samples. Statistical analysis of the accumulated test data permitted a descriptive model to be developed for the estimation of the compactive prestress for samples of compacted New Providence shale. 25 refs.

DESCRIPTORS: \*SHALE, (SOIL MECHANICS, Mathematical Models), STATISTICAL METHODS,  
CARD ALERT: 482, 483, 931, 921, 922

1293047 ID NO. E18207063047  
ENERGY DISSIPATION AND SEISMIC LIQUEFACTION IN SANDS.

Navis, R. O.; Berrill, J. B.  
Univ. of Canterbury, Christchurch, NZ  
Earthquake Eng Struct Dyn v 10 n 1 Jan-Feb 1982 p 59-68  
CODEN IJUEEG

ISSN 0375-6297  
A statistical representation of seismic liquefaction is advanced based on the postulate that pore water pressure increases are proportional to the dissipated seismic energy density. The representation, based on approximately fifty case histories, relates the pore pressure increase to earthquake magnitude, distance to center of energy release, initial effective overburden stress and standard penetration value. The model may be used for analysis of seismic liquefaction risk. An example analysis for the 'South of Market Zone' in San Francisco is carried out in relation to earthquakes on the San Andreas fault. 24 refs.

DESCRIPTORS: \*SAND AND GRAVEL, EARTHQUAKES, SOIL MECHANICS, DYNAMICS, STATISTICAL METHODS, LIQUEFACTION  
IDENTIFIERS: SOIL DYNAMICS, LIQUEFACTION  
CARD ALERT: 483, 931, 922

1293045 ID NO. E18207062975  
SLOPE SAFETY PREDICTION UNDER STATIC AND SEISMIC LOADS.

A Grivas, Dimitri; Asakka, Akira  
Rensselaer Polytech Inst, Troy, NY, USA  
ACE J Geotech Eng Div v 180 n G15 May 1982 p 713-729  
CODEN AIGRE6

ISSN 0093-6305  
A simplified procedure permitting the determination of the probability of failure of natural or man-built slopes under static and seismic conditions is presented. Limit equilibrium is expressed as a function of the soil strength parameters (random variables), the numerical values of which are obtained from strength tests under drained conditions. Seismic load is introduced in terms of the maximum horizontal acceleration expected to occur at the site of the slope. The procedure is applied in a case study to predict the probability of failure of a slope during an earthquake. 22 refs.

DESCRIPTORS: (\*SOIL MECHANICS, \*Mathematical Models), (STRUCTURAL DESIGN, Safety Factor), (STRUCTURAL ANALYSIS, STABILITY), EARTHQUAKE RESISTANCE,  
IDENTIFIERS: SLOPE STABILITY, SEISMIC LOADS  
CARD ALERT: 483, 931, 921, 408, 484

1293049 ID NO. E18207067969  
NEW STABILITY METHOD FOR EMBANKMENTS ON CLAY FOUNDATIONS.

Chapuis, Y. P.  
Montreal, Que, Can  
Can Geotechnol J v 19 n 1 Feb 1982 p 44-48  
CODEN CGJQAH

ISSN 0098-3674  
The proposed method makes use of a conventional total stress analysis, corrected to take into consideration the preconsolidation pressure and the undrained shear strength profiles. Good results are obtained for seven well documented cases of embankment failures, the data of which allow a direct application of the proposed method. Many other failure cases, for which the published data are insufficient to allow such a direct application, are analyzed on a statistical basis discussed in the paper. Bjerrum's correction appears as a particular case, only statistically applicable. Of the proposed method, Refs

DESCRIPTORS: (\*EMBANKMENTS, \*Stability), (CLAY, Foundations), SOIL MECHANICS,  
CARD ALERT: 483, 405

1293315 ID NO. E18207063315  
COMPACTIVE PRESTRESS IN SHALES.

Lovell, C. William; Witsman, Gary R.  
Purdue Univ, West Lafayette, Indiana, USA  
Bull Assoc Eng Geol v 18 n 3 Aug 1981 p 297-308  
CODEN AEGAPU

ISSN 0094-5691  
Shale samples were compacted from shale aggregate by a California kneading compactor. Conventional oedometer tests

vertically propagating seismic S waves. Three different deposit models are developed. The models are effectively one-dimensional and differ in that they include or neglect pore pressure diffusion and stiffness reduction due to pore pressure buildup. Conclusions are drawn about sensitivity of the results to different assumptions about the mechanical behavior of the deposit, about the effect of vertical and horizontal variations of soil properties, and about the importance of statistical variability of the response spectrum at bedrock given peak acceleration. An approximate procedure is proposed for the calculation of the probability of almost complete layer liquefaction. 13 refs.

IDENTIFIERS: LIQUEFACTION ANALYSIS  
CARD ALERT: 483, 931, 921, 484, 922

1264429 ID NO.: E18205044429  
PROBABILITY THEORY IN GEOTECHNICS - AN INTRODUCTION.  
Smith, G. N.  
Heriot-Watt Univ., Edinburgh, Scotl  
Ground Eng v 14 n 7 Oct 1981 p 29-34 CODEN: GROEAV  
ISSN 0017-4653

The article investigates the feasibility of the use of first order second moment methods in the determination of the probability of failure of geotechnical structures. It discusses the theory underlying the first order second moment method evaluation of safety factors. Several examples are included to illustrate the calculation procedures. (PROBABILITY, Failure). (FOUNDATIONS, Design). (ROCK MECHANICS, Design). IDENTIFIERS: LIMIT STATE DESIGN, GEOTECHNICAL STRUCTURES  
CARD ALERT: 483, 931, 922

1274254 ID NO.: E18206054264  
SHEARING BEHAVIOR OF COMPACTED CLAY AFTER SATURATION.  
Lovell, C. W.; Johnson, J. M.  
Purdue Univ., West Lafayette, Indiana, USA  
ASTM Spec Tech Publ 740. Lab Shear Strength of Soil,  
Chicago, Ill, USA, Jun 25 1980. Publ by ASTM, Philadelphia,  
Pa, USA, 1981 p 277-29 CODEN: ASTTAB  
ISSN 0066-0558

The study described was made to ascertain the relationships among the compaction conditions (dry density, moisture content and compaction energy) and the shearing behavior after saturation for a kneading compacted, highly plastic clay. The effective stress strength and pore pressure parameters were evaluated for various compaction conditions through the performance of consolidated undrained triaxial tests with pore water pressure measurement at a constant rate of strain. Statistical analyses were performed to construct prediction equations based on the compaction variables for percent volume change due to saturation and consolidation. 19 refs.  
DESCRIPTORS: \*SOILS, \*Compaction, CLAY, (SOIL MECHANICS, Mathematical Models), STATISTICAL METHODS, (MATERIALS TESTING, Compaction Tests).  
CARD ALERT: 483, 931, 921, 922, 421

1274251 ID NO.: E18206054251  
PROBABILISTIC ANALYSIS OF DEPOSIT LIQUEFACTION.  
Lardis, Michael N.; Veneziano, Daniele  
MIT, Cambridge, Mass, USA  
ASCE J Geotech Eng Div v 108 n GF3 Mar 1982 p 395-417  
CODEN: AJGEB6  
ISSN 0093-6405

A probabilistic methodology is presented for liquefaction analysis of horizontally layered sand deposits, subjected to

1254556 ID NO. - E18204034556  
USE OF PORE SIZE DISTRIBUTION PARAMETERS TO PREDICT PERMEABILITY.

Garcia-Benquerena, I.; Lovell, C. W.; Wood, I. E.  
Purdue Univ, West Lafayette, Indiana, USA  
Proc Eur Conf Soil Mech Found Eng 7th; v 2. Meas. Soil and Use of Des Parameters in Geotech. Eng. Brighton, Engl. Sep 1979. Publ by Br Geotech Soc. London, Engl. 1979 p 49-56  
CODEN: ESMF49

Parameters of pore size distribution are shown to correlate well with experimental values of permeability for compacted mixtures of silt and kaolin. Of the various permeability relations examined, a simple probabilistic version of the variable diameter capillary tube model seemed to be slightly superior. Compacted soils are typically bimodal in their pore size distributions, with the smaller mode representing the spaces within coarse grains and clay aggregations and the larger mode being caused by pores between these grains and aggregations. Permeability depends strongly on the larger interaggregate pores. Fortunately, it is these same pores which are affected by the compaction variables. With a sufficient water content and compactive effort, it is possible to nearly eliminate the larger pores, and thus to sharply reduce permeability. Refs.

DESCRIPTORS: (\*SOILS. \*Permeability). (POROUS MATERIALS. Analysis). PROBABILITY, SOIL MECHANICS.  
IDENTIFIERS: PORE SIZE DISTRIBUTION  
CARD ALERT: 483, 922, 423

1254513 ID NO. - E18204034513  
LABORATORY TESTING ON PIPING.

de Wit, J. M.; Sellmeijer, J. B.; Penning, A.  
Delft Soil Mech Lab, Neth  
Proc Int Conf Soil Mech Found Eng 10th, v 1. Stockholm, Swed. Jun 15-19 1981. Publ by A. A. Balkema, Rotterdam, Neth. and Salem, NH, USA, 1981 p 517-520. CODEN: PCSMB2

The piping mechanism is complicated and an adequate fundamental description has not yet been presented. Normally applied design criteria, in general, are based on statistical methods. Another approach is to find a suitable criterion by laboratory testing on a scale model. At the Delft Soil Mechanics Laboratory an extensive investigation is being carried out on models of dams on permeable foundations. In this approach the determination of scale rules between model and prototype becomes essential. Measured pore pressures showed a good agreement with calculations by the Laplacean equation for steady flow. Moreover it appeared that the pore pressures in the area sensitive to piping are equal in models of different scales provided that the sensitive area has the same geometry in these models.

DESCRIPTORS: (\*SOILS. \*Erosion). (MODELS. Testing). (FLOW OF WATER, Porous Materials). (DAMS, Seepage).  
IDENTIFIERS: INTERNAL EROSION, PIPING  
CARD ALERT: 483, 631, 441

1254533 ID NO. - E18204034533  
PREDICTION OF SUBGRADE MOISTURE CONDITIONS.

Haupt, F. J.  
CSIR, Pretoria, S Afr  
Proc Int Conf Soil Mech Found Eng 10th, v 1. Stockholm, Swed. Jun 15-19 1981. Publ by A. A. Balkema, Rotterdam, Neth. and Salem, NH, USA, 1981 p 149-156. CODEN: PCSMB2

In 1973 an extensive road survey was carried out in the Transvaal, South Africa, that resulted in a mass of information that was subsequently analyzed statistically to arrive at conclusions as to the most important factors affecting the moisture regime and to produce empirical prediction techniques applicable to southern Africa conditions. The analysis included linear and non-linear regressions and the development of models containing only selected parameters. The prediction accuracy of each model is given, together with an indication of the climatic areas in which these models are applicable. The terms 'left double quotes characteristic maximum and minimum moisture content' and 'right double quotes are defined as those moisture contents which have only a specified chance of being exceeded or ever reached respectively. It is proposed that these moisture contents be used in design. Refs.

DESCRIPTORS: (\*SOILS. \*Moisture Determination). (SOIL MECHANICS, Mathematical Models). STATISTICAL METHODS.  
CARD ALERT: 483, 922

175445G ID NO.: E18204034456  
**HOW RELIABLE ARE PRESENT METHODS OF SLOPE FAILURE PREDICTION?**

Grivas, D. A.  
Rensselaer Polytech Inst., Troy, NY, USA  
Proc Int Conf Soil Mech Found Eng 10th, v 3, Stockholm, Swed, Jun 15-19 1981, Publ by A. A. Balkema, Rotterdam, Swed, Jun 15-19 1981, p 427-430 CODEN: PCSMB2  
The paper reports on a study to provide a systematic description of the parameters that constitute the input to slope stability analysis; to examine the reliability of conventional slope failure prediction; and to achieve the above through a case study involving the assessment of the safety of an embankment slope located in western New York. Results are presented of a statistical analysis of a large number of soil data obtained during a comprehensive investigation of the site of the embankment. The safety of the slope is measured in terms of its probability of failure, and the reliability of conventional procedures is investigated through a relation between the latter and the factor of safety. Finally, results (in the form of nomographs) are presented and conclusions are drawn.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Stability), FAILURE ANALYSIS (EMBANKMENTS, Failure), NOMOGRAMS.  
IDENTIFIERS: SLOPE STABILITY, FACTOR OF SAFETY  
CARD ALERT: 483, 931, 922

125444B ID NO.: E1820403444B  
**INFLUENCES ON THE PROBABILITY OF FAILURES OF SLOPES.**

Foerster, W.; Weber, E.  
Bergshad Freiberg, E Ger  
Proc Int Conf Soil Mech Found Eng 10th, v 1, Stockholm, Swed, Jun 15-19 1981, Publ by A. A. Balkema, Rotterdam, Swed, Jun 15-19 1981, p 127-130 CODEN: PCSMB2  
On the basis of O. K. FROHLICH's method, a stochastic variant is represented to express the static stability of slopes by probabilities of failure. Cohesion and the coefficient of friction are random variables. The influence of correlations between the shearing parameter and assumption of normal, equal and empiric distribution respectively of these parameters on the probability of failure is shown in an example.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Stability), FAILURE ANALYSIS (PROBABILITY, SLOPE STABILITY)  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 931, 922

1254445 ID NO.: E18204034445  
**SHORT-TERM RELIABILITY OF SLOPES UNDER STATIC AND SEISMIC CONDITIONS.**

Asakura, Akira; Athanasiou-Grivas, Dimitri  
Transp Res Rec 809 1981 p 64-70 CODEN: TRREDM  
ISSN 0361-1981  
A simplified probabilistic approach to the determination of

the short-term reliability of clayey slopes under static and seismic conditions is presented. The uncertainties associated with the undrained strength of soil and its spatial variation and the analytic procedure used to assess the safety of the slope are considered, and probabilistic tools are introduced for their description and amelioration. 11 refs.

DESCRIPTORS: (\*SOIL MECHANICS, \*Mathematical Models), (GEOPHYSICS, Seismic), PROBABILITY, CLAY.  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 931, 921, 481, 484

1254444 ID NO.: E18204034444  
**DYNAMIC DESIGN PHILOSOPHY IN SETTLEMENT PREDICTION.**

Matsuo, M.; Asakura, A.  
Nagoya Univ, Jpn  
Proc Int Conf Soil Mech Found Eng 10th, v 1, Stockholm, Swed, Jun 15-19 1981, Publ by A. A. Balkema, Rotterdam, Swed, Jun 15-19 1981, p 195-198 CODEN: PCSMB2  
An observational procedure of settlement prediction is developed, in which future settlement is estimated through identification of unknown soil conditions using observation of settlement behavior at early stages of consolidation. The proposed method has been judged to have high accuracy through examination of case records obtained from reclaimed land on soft clay deposits in Japan. A probabilistic description of the accuracy of settlement prediction is also provided, and to be possible based on the proposed method.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Consolidation), LAND RECLAMATION, SUBSIDENCE, PROBABILITY.  
CARD ALERT: 483, 931, 922

(MATHEMATICAL STATISTICS, Monte Carlo Methods).  
IDENTIFIERS: SOIL SLOPES  
CARD ALERT: 483, 931, 922

1253827 ID NO. - E18204032827  
MECHANISM OF EROSION IN NONCOHESIVE SOILS.

Naschmento, U.  
Natl Civ Eng Lab, Lisbon, Port  
Proc Int Conf Soil Mech Found Eng 10th, v 1, Stockholm, Swed, Jun 15-19 1981. Publ by A. A. Balkema, Rotterdam, Neth, and Salem, NJ, USA, 1981 p 209-213. CODEN: PCSMB2  
Reference is made to the fact that the shear stress due to water flow, needed to start erosion in a sandy bed, is only 1/10 to 2/10 of the resistance to shear of the monogranular layer of the bed, deduced from Coulomb's law. The erosion mechanisms proposed by some authors are analyzed. A new mechanism is suggested by which the stresses on the particles of random fluctuations of drag and lift forces are explicitly considered. Using the concepts of the safety coefficient  $F$  equal to the ratio of shear resistance to shear stress and of the probability  $P$  of the beginning of erosion, a graph is presented for calculating  $F$  as a function of  $P$  and of the coefficients of variation of shear resistance and stress. It is thus shown that the fractions 1/10 and 2/10 are but the inverse of the coefficient of safety from 5 to 10. A test is suggested for determining the angle of repose. Refs.  
DESCRIPTORS: (\*SAND AND GRAVEL, \*Erosion). (FLOW OF WATER, Drag), SOIL MECHANICS.  
CARD ALERT: 483, 931, 631

1254432 ID NO. - E18204034432  
MEASUREMENT, SELECTION AND USE OF DYNAMIC SOIL PROPERTIES IN DESIGN.

Michalopoulos, A. P.; Hansen, K. R.; Rynaud, D. A.; Arias, R. P.  
D'Appollonia Consult Eng Inc, Brussels, Belg  
Proc Eur Conf Soil Mech Found Eng 7th, v 2, Meas, Sel and Use of Des Parameters in Geotech Eng, Brighton, Engl, Sep 1979. Publ by Br Geotech Soc, London, Engl, 1979 p 257-260. CODEN: ESMFA9  
During the past several years the authors have conducted cross-hole investigations at twenty different soil/rock sites in various countries. The design parameters obtained from which are usually employed to develop dynamic soil-structure interaction parameters. The authors have evaluated the probable variation in soil properties obtained from field and laboratory measurements, by performing statistical analyses employing randomly generated values of the soil input parameters falling between limits of plus and minus one standard deviation of the mean values. The results indicate that a considerable reduction of the sensitivity factor accounting for the effects of inhomogeneities in soil properties and imperfections in analytical techniques, could be justified when a realistic variation of soil input parameters is considered.  
DESCRIPTORS: \*SOIL MECHANICS, DYNAMICS, ROCK MECHANICS, FOUNDATIONS, Soil-Structure Interaction).  
IDENTIFIERS: DYNAMIC PROPERTIES  
CARD ALERT: 483, 931

1254431 ID NO. - E18204034431

RELIABILITY APPROACH TO THE DESIGN OF SOIL SLOPES.

Athanasou Grivas, D.; Harr, M. E.  
Rensselaer Polytech Inst, Troy, NY, USA  
Proc Eur Conf Soil Mech Found Eng 7th, v 1, Meas, Sel and Use of Des Parameters in Geotech Eng, Brighton, Engl, Sep 1979. Publ by Br Geotech Soc, London, Engl, 1979 p 95-99. CODEN: ESMFA9

Observed numerical values of soil strength parameters and the randomness associated with the phenomenon of left double quotes failure right double quotes dictate the use of probabilistic theory and reliability analysis in the design of geotechnical systems. The objectives of the study reported in this paper were to expose some uncertainties in the strength of soils and provide a statistical description for the variation of the two strength parameters  $c$  (cohesion) and  $\phi$  (angle of internal friction); and to apply a developed probabilistic model to study the reliability of a given slope. The main features of the model are reviewed and the method followed for the selection of design values of  $c$  and  $\phi$  is presented. The safety of the slope is measured in terms of its probability of failure (rather than the conventional factor of safety), the numerical values of which are determined through a Monte Carlo simulation. Refs.  
DESCRIPTORS: \*SOIL MECHANICS, RELIABILITY, SOILS, Stability

1253643 ID NO. - E18204033643

PROBABILITY OF KINEMATIC INSTABILITY IN ROCK SLOPES - A NUMERICAL APPROACH.

Glynn, E. F.; Einstein, H. H.  
Univ of Pa, Philadelphia, USA  
Proc Symp Rock Mech 20th, Austin, Tex, USA, Jun 4-6 1979. Publ by Univ of Tex, Austin, USA, 1979 p 317-325. CODEN: PSRMA6

ISSN 0085-574X  
The fact that joint orientations are random variables must be considered in slope reliability analysis consisting of probabilistic kinetic and kinematic analysis. This paper presents a numerical procedure to establish the probability of kinematic instability of a 2-joint rock wedge. 6 refs.  
DESCRIPTORS: (\*ROCK MECHANICS, \*Stabilization).  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 502

1252636 ID NO. - E1R204031636  
ON THE INFERENCE OF CRACK STATISTICS FROM OBSERVATIONS ON AN  
OUTCROPPING.

Dinms, J. K.  
Los Alamos Sci Lab, NM, USA  
Proc Symp Rock Mech 20th, Austin, Tex, USA, Jun 4-6 1979  
Publ by Univ of Tex, Austin, USA, 1979 p 259-263 CODEN  
PSRMA6  
ISSN 0085-574X

This paper considers two problems. The direct problem is to find the distribution of line segments in a plane section when the three-dimensional distribution of cracks is homogeneous, isotropic, and exponential. The indirect problem is to infer the three-dimensional distribution of cracks from the distribution on a section which could be an outcropping. Refs

DESCRIPTORS: (\*ROCK MECHANICS. \*Mathematical Models).  
CARD ALERT: 483, 502, 921

1252627 ID NO. - E1R204033627  
STATISTICS OF STRUCTURAL RESPONSES TO SEISMIC WAVES FILTERED  
THROUGH ROCK AND SOIL FORMATIONS.

Spanos, P. T. D.  
Univ of Tex, Austin, USA  
Proc Symp Rock Mech 20th, Austin, Tex, USA, Jun 4-6 1979.  
Publ by Univ of Tex, Austin, USA, 1979 p 273-278 CODEN  
PSRMA6

The response of a single-degree-of-freedom linear structure to seismic waves is examined. Alteration of seismic waves due to random reflections, refractions and attenuations occurring during their propagation through complex rock and soil formations are represented by a simple probabilistic model. The dependence of mean energy on the natural frequency and ratio of critical damping of the structure is examined. Refs

DESCRIPTORS: \*ROCK MECHANICS. (SEISMIC WAVES, Transmission).  
CARD ALERT: 483, 502, 484

1252615 ID NO. - E1R204033615  
STATISTICAL PREDICTION FORMULA FOR COMPRESSIVE STRENGTH OF A  
ROCK.

Jong, A. P.; Lele, V. S.  
Cent Water & Power Res Stn, Pune, India  
Rock Mech v 13 n 4 Mar 1981 p 215-220 CODEN RRMFMS  
ISSN 0035-7448

Compressive strength of a rock, among other mechanical properties, is known to be related to its water absorbing capacity, which is thus appropriately termed its quality index. Mapping of foundation areas and the acceptance of stones in masonry could be based on this relationship. However, the existing literature on rock mechanics does not give any prediction formula for compressive strength of a rock in terms of its quality index. Such prediction formulas for

basalt and sandstone at two sites have been developed and are presented in this paper. The 95% confidence belts for the estimated compressive strengths have also been worked out. The locus of the lower confidence limit for the estimated compressive strength enables determination of the maximum permissible quality index.

DESCRIPTORS: (\*ROCK. \*Mechanical Properties). STATISTICAL METHODS. ROCK MECHANICS.  
CARD ALERT: 483, 421, 922

1252768 ID NO. - E1R204032768  
STATISTICAL CONSIDERATIONS IN PILE TESTING.

Preiss, K.; Shapiro, J.  
Ben-Gurion Univ of the Negev, Beer Sheva, Isr  
Proc Int Conf Soil Mech Found Eng 10th, v 2, Stockholm, Swed, Jun 15-19 1981. Publ by A. A. Balkema, Rotterdam, Neth, and Salem, NH, USA, 1981 p 799-802 CODEN: PCSMB2  
When using integrity tests for quality control of piles or diaphragm wall sections, the responsible engineer must decide how many piles or elements to test. This paper provides a statistical guide for that decision. Refs

DESCRIPTORS: (\*PILES. \*Testing). STATISTICAL METHODS. SAMPLING. SOIL MECHANICS.  
CARD ALERT: 405, 483, 922

1252749 ID NO. - E18204032749  
**PERFORMANCE OF FRICTION PILES IN BANGKOK SUBSOILS.**

Balasubramaniam, A. S.; Photo-yanuvat, C.; Ganesananthan, R.; Lee, K. K.

AIT, Bangkok, Thailand, v. 2, Stockholm, Sweden, Jun 15-19 1981, Publ by A. A. Balkema, Rotterdam, Neth., and Salem, NH, USA, 1981 p 605-610 CODEN: PCSMB2

An extensive research program has recently been completed on the behavior of more than forty full scale driven piles in twelve projects in the Bangkok plain. The ultimate bearing capacity of the piles was evaluated using Dutch cone test data as well as total and effective stress methods. Wave equation analysis was also carried out as an improvement on the normal use of dynamic pile driving formulas. Dutch cone test data are found to be most useful in predicting the ultimate bearing capacity of driven piles varying in lengths from 6 to 30 m. The total stress method is found to estimate reasonably well the bearing capacity of long piles bearing in stiff clay and in the sand layer. The effective stress method is also found to be promising for long piles. The wave equation analysis indicated that the ultimate bearing capacity as measured from test loads is about 1.22 to 1.4 times the predicted soil resistance. Results indicate that the expressions derived by M. E. Harr can be used to obtain a relationship between the central factor of safety and the probability of failure.

DESCRIPTORS: (\*PILES, \*Friction), SOIL MECHANICS, FAILURE ANALYSIS.

CARD ALERT 405, 483, 931

1251669 ID NO. - E18204031669  
**JOINTED ROCK MASS CHARACTERISTICS AND THEIR INFLUENCE ON SLENDER PILLARS.**

Miller, D. R.; Barrett, J. R.

CSIRO, Aust  
 Proc Symp Rock Mech 20th, Austin, Tex, USA, Jun 4-6 1979, Publ by Univ of Tex, Austin, USA, 1979 p 199-208 CODEN: PSRMAG

ISSN 0095-574X  
 Techniques are examined for the collection of data on orientation, spacing, persistence and roughness. Methods are outlined for determining support of wedges in exposed pillar walls and for statistical treatment of pillar failure by joint transection. Unstable roof blocks are determined by the limiting horizontal stress across the roof or density of artificial support 40 refs.

DESCRIPTORS: (\*MINES AND MINING, \*Room and Pillar), ROCK MECHANICS, (TUNGSTEN MINES AND MINING, Room and Pillar).

CARD ALERT 502, 504, 483

1250953 ID NO. - E18204030953  
**MEASUREMENT, TRIAL USE AND SELECTION OF INITIAL DESIGN PARAMETERS FOR DIKES ON VERY SOFT CLAY IN THE DEAD SEA, JORDAN.**

Knight, D. J.; Brice, G. J.  
 Sir Alexander Gibb & Partners, Reading, Engl  
 Proc Eur Conf Soil Mech Found Eng 7th, v.3, Meas, Soil and Use of Des Parameters in Geotech Eng, Brighton, Engl, Sep 1979, Publ by Br Geotech Soc, London, Engl, 1979 p 93-101 CODEN: ESMFA9

The paper describes the unusual site and foundation conditions, investigation methods and design, construction and behavior of trial dikes and resulting mud waves, including the successful repair of a failed dike, in the southern part of the Dead Sea in Jordan. Results are presented of foundation parameters as measured by in-situ and laboratory tests, with comparisons of those deduced from back analysis of the induced full-scale failures. The variability of the results is discussed, together with the approach to the selection of initial design parameters and factor of safety, based on statistical analysis of the geotechnical data and consideration of the consequent extent of future failures. The use of those parameters in the preliminary design of the dikes is described.

DESCRIPTORS: (\*LEVEES, \*Foundations), (CLAY, Testing), SOIL MECHANICS, (SOILS, Failure), (FOUNDATIONS, Design).

IDENTIFIERS: SOFT CLAY  
 CARD ALERT 442, 483, 405

1249677 ID NO. - E18204029677  
**SOIL/STRUCTURE INTERACTION AND SOILS HETEROGENEITY.**

Vataias, D. Th.; Hatzigogos, Th. N.; Tsotsos, S. S.  
 Aristotelian Univ of Thessaloniki, Greece  
 Proc Int Conf Soil Mech Found Eng 10th, v.1, Stockholm, Swed, Jun 15-19 1981, Publ by A. A. Balkema, Rotterdam, Neth., and Salem, NH, USA, 1981 p 255-258 CODEN: PCSMB2

In this paper the influence of spatial variability of deformation characteristics on contact pressure distribution and settlement predictions in a soil-structure interaction problem is studied. The computation of contact pressures and settlements is based on a modified version of dynamic relaxation method presented in the second part of the paper. In the third part a probabilistic formulation is presented. In the last part the proposed process is applied to the study of a rigid isolated foundation.

DESCRIPTORS: (\*FOUNDATIONS, \*Soil Structure Interaction), SOIL MECHANICS, PROBABILITY.

CARD ALERT 405, 483, 931

cone resistance in Pliocene clays. Glaciotectonical processes caused clay to have strong anisotropic properties. A statistical evaluation of the properties of clay is presented. A and comments are made on the causes of differences between the measured cone resistance and that calculated from the bearing capacity equation. Refs.  
 DESCRIPTORS: (\*CLAY. \*Testing). (SOILS. Mechanical Properties). (INSTRUMENTS. Probes). SOIL MECHANICS. IDENTIFIERS: PENETROMETERS. STATIC SOUNDING CARD ALERT: 483, 421, 422

1244898 ID NO. - E18203024898  
**CONFIDENCE IN THE FAILURE ENVELOPE.**  
 Bland, J. A.  
 Liverpool Polytech. Eng  
 Proc Inst Civ Eng (London) v 71 pt 2 Jun 1981 p 537-541  
 CODEN: PCIEAT  
 ISSN 0020-3262  
 The shear strength parameters of soil appropriate to the range of interest are determined analytically and a simple linear relationship between normal stress and shear strength is proposed which defines a lower bound for the shear strength at a particular level of statistical confidence. 3 refs.  
 DESCRIPTORS: (\*SOILS. \*Failure). MATHEMATICAL MODELS. SOIL MECHANICS. (STRESSES. Analysis). IDENTIFIERS: SHEAR STRENGTH CARD ALERT: 483, 921, 931, 421

1235782 ID NO. - E18202015782  
**MULTIPLICITY OF NUMERICAL SOLUTIONS FOR SLOPE STABILITY PROBLEMS.**  
 Chugh, Ashok K.  
 US Bur of Reclam, Denver, Colo, USA  
 Int J Numer Anal Methods Geomech v 5 n 3 Jul-Sep 1981 p 313-322 CODEN: IJNRDZ  
 Existence of more than one numerical solution to the slope stability equations derived on the basis of force and moment equilibrium requirements of statistics is indicated. These solutions satisfy the boundary conditions at both ends of a potential slide mass. In the particular case considered, the details of the calculated response for the slices for each solution set assist the designer in selecting the more reasonable solution to the problem.  
 DESCRIPTORS: (\*SOIL MECHANICS. \*Stability). (LANDSLIDES. Analysis). IDENTIFIERS: SLOPE STABILITY CARD ALERT: 483, 931

1249659 ID NO. - E18204029659  
**INTEGRITY AND AS-BUILT CAPACITY OF BORED PILE GROUP.**  
 Kissenfering, J. F.; Weirhold, H. F.  
 D'Appolonia Consult Eng Inc, Pittsburgh, Pa, USA  
 Proc Int Conf Soil Mech Found Eng 10th, v 2, Stockholm, Swed, Jun 15-19 1981. Publ by A. A. Balkema, Rotterdam, Neth, and Salem, NH, USA, 1981 p 747-749 CODEN: PCSMB2  
 This paper summarizes field testing and analytical methods used to evaluate the static as-built capacity of a large group of bored piles bearing on hard rock and underlying a practically rigid superstructure. The ultimate, as built capacity-to-load ratio was determined as a function of a variable probability level, which is described in the paper. Refs.  
 DESCRIPTORS: (\*FOUNDATIONS. \*Piles). SOIL MECHANICS. PROBABILITY. PILE GROUPS. BORED PILES CARD ALERT: 405, 483, 931

1249644 ID NO. - E18204029644  
**STATISTICAL DIMENSIONING OF SLURRY TRENCH WALLS.**  
 Bolya, J.; Regale, Z.; Sandor, I.  
 Tech Univ, Budapest, Hung  
 Proc Int Conf Soil Mech Found Eng 10th, v 2, Stockholm, Swed, Jun 15-19 1981. Publ by A. A. Balkema, Rotterdam, Neth, and Salem, NH, USA, 1981 p 57-60 CODEN: PCSMB2  
 The determination of the load bearing capacity of slurry trench walls loaded by a vertical force and of the resulting settlement presents a number of design difficulties, because of the theories relating to this deliver significantly different results, which leads generally to the overdimensioning of the foundation. This paper reports on an empirical determination of bearing capacity-settlement based on mathematical-statistical processing of data from 300 load slurry trench wall foundations under different geotechnical conditions.  
 DESCRIPTORS: (\*FOUNDATIONS. \*Design). STATISTICAL METHODS. (RETAINING WALLS. Design). SOIL MECHANICS. IDENTIFIERS: SLURRY TRENCH WALLS CARD ALERT: 405, 483

1247312 ID NO. - E18204027312  
**BEARING CAPACITY EQUATIONS OF STATIC SOUNDING OF PLIOCENE CLAY.**  
 Mlynski, Z. B.; Sanglerat, G.  
 Inst of Water Eng, Poznan, Pol  
 Proc Int Conf Soil Mech Found Eng 10th, v 2, Stockholm, Swed, Jun 15-19 1981. Publ by A. A. Balkema, Rotterdam, Neth, and Salem, NH, USA, 1981 p 523-526 CODEN: PCSMB2  
 General bearing capacity equations for a plane horizontal strip foundation were adopted by numerous authors to interpret results of static sounding. This paper contains evaluations of the usefulness of this equation in determining changes of

1235781 ID NO. - E18202015781  
**PROBABILISTIC SOIL EXPLORATION: CASE HISTORY**  
Wu, Tien H.; Wong, Kinfun  
Ohio State Univ., Columbus, USA  
ASCE J. Geotech Eng Div v 107 n 12 Dec 1981 p 1697-1711  
CODEN: AJGFB6  
ISSN 0893-6405

Probability concepts are applied to the interpretation of soil exploration data at a site where failure in a weak layer is considered probable. The subsol is modeled as a two class material with soft clay layer as included within a stiff clay. A hypothetical case history is constructed to illustrate the interpretation of data obtained at different stages of the soil exploration program. The analysis of the soil exploration program considers detection and recognition of the soft material and inference that the soft material exists at unexplored locations, given that it has been detected at explored locations. The judgment of practicing engineers regarding the site conditions are presented as subjective probabilities.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Mathematical Models), CLAR, PROBABILITY.  
IDENTIFIERS: SOIL STRATIFICATION  
CARD ALERT: 483, 931, 921, 922

1227348 ID NO. - E18201007348  
**STATIC PENETRATION TEST RESULTS WITH SOILS HAVING SLIGHT OR MEDIUM COHESION.**  
Kozdi, A.; Mlynarek, Zb.  
Hung Acad of Sci, Budapest  
Acta Tech (Budapest) v 90 n 3-4 1980 p 187-199 CODEN: ATSHAB  
ISSN 0001-7035

The paper analyzes the influence of the phase composition (volume percentages of solid, air and water) on the cone resistance during static penetration test. The static sounding test was carried out using the laboratory device. The function which furnishes the relationship between cone resistance and phase composition was determined numerically. The analysis of the cohesion and angle on internal friction effect has been done using statistical methods. 22 refs.  
DESCRIPTORS: (\*SOILS, \*Testing), MATHEMATICAL MODELS, STATISTICAL METHODS, SOIL MECHANICS, FRICTION.  
CARD ALERT: 483, 421, 921, 922, 931

1227311 ID NO. - E18201007311  
**PROBABILISTIC EVALUATION OF NATURAL SLOPE FAILURE.**  
Choudhury, Robin N  
Univ of Wollongong, NSW, Aust  
Eng for Prot from Nat Disasters, Proc of the Int Conf, Bangkok, Thailand, Jan 7-9 1980 Publ by John Wiley & Sons, Ltd, Chichester, Engl and New York, NY, 1980 p 605-614  
The role of probabilistic approaches in evaluation of stability is highlighted after a brief summary of various

sources of uncertainty in problems concerned with natural slopes. A method for determining the probability of failure of long, natural slopes is outlined and it is shown that the most probable length or extent of failure can be evaluated on this basis. Attention is restricted to uncertainty in shear strength of slope materials but the method can be extended to include uncertainties in other parameters.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Stability), (LANDSLIDES, Analysis), PROBABILITY.  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 931, 922

1226437 ID NO. - E18201006437  
**ESTIMATING THE MEAN LENGTH OF DISCONTINUITY TRACES.**  
Paul, P. J.  
CSIRO, Victoria, Aust  
Int J Rock Mech Min Sci Geomech Abstr v 18 n 3 Jun 1981 p 221-228 CODEN: IRMG8G

A technique is proposed for estimating the mean trace length of discontinuities observed in mine drive walls. The method is distribution-free, i. e. independent of the assumed functional form of the statistical distribution of trace lengths, and no knowledge of the actual lengths of the observed traces is required. Under the very general assumption that trace midpoints are randomly and homogeneously distributed, all that needs to be known about each trace is whether it is censored or not. The method is restricted to a set of parallel traces of arbitrary direction. It is shown that, if the joint survey imposes a cut off at some length below which traces are ignored, the method provides an exact solution if the trace length distribution can be assumed to be exponential.  
DESCRIPTORS: \*ROCK MECHANICS, GEOLOGY, (ROCK, Testing), IDENTIFIERS: DISCONTINUITIES, ROCK JOINT TRACES  
CARD ALERT: 483, 502, 481

1226436 ID NO. - E18201006436  
**ESTIMATION OF DISCONTINUITY SPACING AND TRACE LENGTH USING  
 SCANLINE SURVEYS**

Priest, S. D.; Hudson, J. A.  
 Int J Rock Mech Min Sci Geomech Abstr v 18 n 3 Jun 1981 p  
 183-197 CODEN: IRMG8G

The characteristics of discontinuities can be estimated using scanline surveys, but the precision of the estimates must be obtained and the bias caused by linear sampling must be eliminated before they can validly be used. Initially, an expression is presented which gives the degree of confidence that can be assigned to the measured mean discontinuity spacing. A reduced form of this expression is obtained for cases where the discontinuity spacings follow the negative exponential distribution. The distribution of trace lengths produced by the intersection of planar discontinuities with a planar rock face is used to determine the distribution of trace lengths, the distribution of semitrace lengths and the distribution of censored semi-trace lengths intersected by a randomly located scanline. Comparison of the actual and sampled distributions demonstrates the bias introduced by scanline sampling of trace lengths. 13 refs.

DESCRIPTORS: \*ROCK MECHANICS, (TROUGH, Testing), (SAMPLING, Analysis), PROBABILITY, GEOLOGY.  
 IDENTIFIERS: ROCK MASSES, SCANLINE SURVEYS, DISCONTINUITIES  
 CARD ALERT: 483, 502, 922

1203965 ID NO. - E18112103965  
**STATISTICAL ANALYSIS OF SAND LIQUEFACTION**

Fardis, Michael N.; Veneziano, Daniele  
 MIT, Cambridge, Mass  
 ASCE J Geotech Eng Div v 107 n 10 Oct 1981 p 1361-1377  
 CODEN: AJGEB6  
 ISSN 0093-6405

A consistent set of stochastic models is developed for the liquefaction resistance of a homogeneous mass of sand, such as a laboratory sample or small element of in situ material. A probabilistic model for liquefaction in the laboratory for undrained simple shear tests is developed first. This model gives the probability distribution of the number of cycles to liquefaction as a function of uniform shear stress amplitude, mean initial effective stress, and relative density. Corrections are quantified and incorporated into the model. Parameters are estimated from a large number of simple shear test results obtained by eight different groups of researchers using several sands and testing techniques. The laboratory liquefaction model is converted into one applicable in the field. Finally, the model is generalized to load cycles with nonuniform shear stress amplitude. 37 refs.

DESCRIPTORS: (\*SOIL MECHANICS, \*Mathematical Models), SAND AND GRAVEL, STATISTICAL METHODS, PROBABILITY, IDENTIFIERS: SAND LIQUEFACTION, SHEAR TESTS  
 CARD ALERT: 483, 931, 921, 922

1203955 ID NO. - E18112103955  
**RELIABILITY APPROACH TO THE DESIGN OF GEOTECHNICAL SYSTEMS.**

Athanasios-Griivas, Dimitri  
 Rensselaer Polytech Inst, Troy, NY  
 Dev in Theor and Appl Mech, v 10, Proc of the Southeast Conf on Theor and Appl Mech, 10th, Knoxville, Tenn, Apr 17-18 1980 Sponsored by Univ of Tenn, Knoxville, 1980 p 163-188

The capacity (C) and demand (D) of a structure are introduced as random variables and the expression of its probability of failure is provided for the case where both C and D follow a simplified distribution. When C and D are complicated functions of one or more random variables, then the reliability of a structure is found through a Monte Carlo simulation of failure. In a case study, combinatory reliability analysis is used to assess the safety of a geotechnical system composed of a retaining wall, a soil slope and a footing. On the basis of the analysis and the results of this study, it is concluded that the probability of failure is a viable alternative to the conventional factor of the safety, and a system reliability approach can be used for the analysis of complex geotechnical systems. 17 refs.

DESCRIPTORS: \*SOIL MECHANICS, (PROBABILITY, Failure), STRUCTURAL ANALYSIS, RELIABILITY, IDENTIFIERS: GEOTECHNICAL SYSTEMS  
 CARD ALERT: 483, 931, 922

1198241 ID NO. - E18112098241  
**RANDOM VIBRATION ANALYSIS FOR THE SEISMIC RESPONSE OF EARTH  
 DAMS.**

Gazetas, G.; Debechaudhury, A.; Gasparini, D. A.  
 Case West Reserve Univ, Cleveland, Ohio  
 Geotechnique v 31 n 2 Jun 1981 p 261-277 CODFN: GTNDAB  
 ISSN 0016-8505

A new random vibration formulation is introduced and employed to study characteristics of the dynamic behavior of earth dams modeled as inhomogeneous shear beams and excited by strong motions consisting of vertical shear waves. Results are presented in the form of variation with time, and distribution with depth from the crest, of statistics of displacements, accelerations, shear strains and seismic coefficients on potential sliding masses. Key factors that influence the dynamic behavior are identified and their effect is demonstrated through a number of parametric plots. 33 refs.

DESCRIPTORS: (\*DAMS, EMBANKMENT, \*Earthquake Resistance), (SOIL MECHANICS, Mathematical Models), VIBRATIONS, IDENTIFIERS: RANDOM VIBRATION  
 CARD ALERT: 441, 484, 483, 931, 921

1185040 ID NO. - E181195040  
**RELATION BETWEEN CBR AND 'STATIC' MODULUS OF DEFORMATION OF  
 STABILIZED LATERTIC SOILS.**

Ola, Samiel A  
 Univ of Benin, Niger  
 Soil Mech Foundt Eng Proc Reg Conf Afr 7th, V 1, Accra,  
 Ghana, Jun 1980 Publ by A. A. Balkema, Rotterdam, Neth.  
 1980 p 223-232 CODEN SMAFBS  
 California Bearing Rates (CBR) and load tests have been  
 carried out on different types of lateritic soils from A-1 to  
 A-7. Through simple regression analysis, functional  
 relationships were obtained between soaked CBR, unsoaked CBR  
 and Sierf double quot's. 'Static' modulus of deformation for  
 the lateritic soils of the Zaria area in the Savannah zone of  
 Northern Nigeria. These regression equations permit  
 estimation of 'static' modulus of deformation. It is also  
 shown that the 'static' modulus will tend to the dynamic  
 modulus at a critical CBR. The approach used should be  
 applicable in other areas where CBR is utilized for road  
 design. The use of lateritic soil is only incidental. 11  
 refs

DESCRIPTORS (-SOILS, \*Mechanical Properties), (ROADS AND  
 STREETS Stabilization), MATERIALS TESTING, SOIL MECHANICS, (  
 STATISTICAL METHODS, Regression Analysis).  
 IDENTIFIERS LATERTIC SOILS  
 CARD ALERT 483, 421, 931

1186206 ID NO. - E1811086206  
**R-FACTORS FOR SOIL LOSS IMPACT PREDICTION**  
 Riggins, Robert E.; Bandy, John T.  
 US Army Constr Eng Res Lab, Champaign, Ill  
 ASCE J Environ Eng Div v 107 n 4 Aug 1981 p 851-857  
 CODEN JEEGAV  
 ISSN 0098-7914

A procedure has been developed to determine design R-values  
 for use with the Universal Soil Loss Equation in soil-loss  
 prediction during environmental impact analysis. The  
 procedure brings together a new method of computing R-values,  
 the concept of simple risk and the use of readily available  
 precipitation data. A test of the procedure using  
 precipitation data from Texas and Georgia showed that R values  
 calculated with the new method follow a log-normal probability  
 distribution. A relationship was found between R-values  
 computed using the new method and R-values published in  
 Agriculture Handbook NO. 537. 8 refs

DESCRIPTORS (-SOIL MECHANICS, \*Mathematical Models),  
 ENVIRONMENTAL IMPACT, (SOILS, Erosion).  
 CARD ALERT 483, 931, 921, 901

1185639 ID NO. - E1811085639  
**ON THE OPTIMUM DESIGN OF ROCK MECHANICS PARAMETRIC STUDIES  
 WITH NUMERICAL MODELS.**  
 Kling, Melvin I  
 RE/SPEC Inc., Rapid City, SD

Proc Symp Rock Mech 21st, Rock Mech: A State of the Art,  
 Univ of Mo, Rolla, May 28-30 1980. Publ by Univ of Mo, Rolla,  
 1980 p 566-569 CODEN PSRMA6  
 ISSN 0085-574X

A specific technique from the statistical theory of design  
 of experiments is applied to a numerical parametric study in  
 rock mechanics. The parametric study involves excavation of  
 an underground cavern with seven parameters. Each parameter  
 is assumed to take on two values: a mean value and an extreme  
 value. The method gives experimental designs called  
 multifactorial designs. The minimum design for this example  
 called for eight numerical experiments, which give sufficient  
 information to compute the effects of each parameter on the  
 experimental outcome. The outcome of each numerical  
 experiment is a factor of safety computed from a pressure  
 sensitive failure criterion. Two cases were considered:  
 intact rock and jointed rock.

DESCRIPTORS (-ROCK MECHANICS, \*Mathematical Models),  
 TUNNELS AND TUNNELING, PARAMETRIC STUDIES  
 IDENTIFIERS: PARAMETRIC STUDIES  
 CARD ALERT: 483, 502

1185632 ID NO. - E1811085632  
**ANALYSIS OF THE SPATIAL VARIATION IN ROCK MASS PROPERTIES  
 THROUGH GEOSTATISTICS.**

Univ of Wis, Madison  
 Proc Symp Rock Mech 21st, Rock Mech: A State of the Art,  
 Univ of Mo, Rolla, May 28-30 1980. Publ by Univ of Mo, Rolla,  
 1980 p 570-580 CODEN PSRMA6  
 ISSN 0085-574X

In this paper, geostatistics, a technique developed for  
 estimating block ore grade and tonnage, is adapted to predict  
 the scalar, vectorial and tensorial rock properties important  
 to rock engineering. A geostatistical analysis of jointing in  
 a quarry at Lannon, WI, confirms the potential of a variable  
 and inhomogeneous rock mass. Geostatistics indicates the  
 degree of inhomogeneity in the frequencies and orientations of  
 two distinct joint sets, and estimates the distance to which  
 these properties can be extrapolated. Additionally, the  
 results suggest that each joint set can be represented by a  
 regional semivariance function plus a more local oscillatory  
 component corresponding to the average spacing of the most  
 persistent joints. 30 refs.

DESCRIPTORS: \*ROCK MECHANICS, STATISTICAL METHODS, (GEOLOGY,  
 Engineering), MATHEMATICAL MODELS,  
 IDENTIFIERS: GEOSTATISTICS, ROCK MASS PROPERTIES, ROCK  
 JOINTS  
 CARD ALERT 483, 502, 922

1185619 ID NO. - E1811085619  
**UNIAXIAL STRENGTH OF ROCK MATERIAL.**  
Wijk, Gunnar  
Atlas Copco MCI Cent Lab, Stockholm, Swed  
Geotech Test J v 3 n 3 Sep 1980 p 115-119 CODEN: GTJDDJ  
ISSN 0149-6115

Uniaxial tensile and compressive strength were determined for a granite, a marble, and a sandstone. There was no statistically detectable difference between the strength values of large and small samples, although the volume ratio of the samples was 20 or more. Further, strain gage measurements taken during the compression tests on the granite revealed strength values that were remarkably independent of the unavoidable eccentricities of the sample loads. 13 refs.  
DESCRIPTORS: (\*ROCK, \*Mechanical Properties), MATERIALS TESTING, ROCK MECHANICS.  
CARD ALERT: 483, 421

1185613 ID NO. - E1811085613  
**COMPUTATIONAL APPROACH TO ROCK FRAGMENTATION.**  
Dienes, J. K.; Morgolin, L. G.  
Los Alamos Sci Lab, NM  
Proc Symp Rock Mech 21st, Rock Mech. A State of the Art, Univ of Mo, Rolla, May 28-30 1980. Publ by Univ of Mo, Rolla, 1980 p 390-399 CODEN: PSRMA6  
ISSN 0085-574X

A method for numerical modelling of rock fragmentation has been developed using a statistical approach to estimate the effect of flaws on rock masses. The method is based on two theoretical results. The first involves an explicit formula for the strain due to crack opening and crack shear resulting from stress on an ensemble of penny-shaped cracks. The second concerns the calculation of crack opening and crack stability for a penny-shaped crack under an arbitrary three-dimensional state of stress. The general theory accounts for the effects of open cracks and closed cracks separately, with the effect of interfacial friction on closed cracks playing an important role. A series of calculations showing the effect of strain rate on stress at a fixed strain is described. Refs.  
DESCRIPTORS: (\*ROCK, \*Fracture), ROCK MECHANICS, (STRESSES, Strain), (MATERIALS, Crack Propagation).  
IDENTIFIERS: ROCK FRAGMENTATION  
CARD ALERT: 483, 421, 502

1184510 ID NO. - E1811084510  
**STATISTICAL ANALYSIS AND MODELING OF THE PHYSICAL, MECHANICAL, AND STRENGTH PROPERTIES OF OIL SHALE.**  
Bondurant, E. J.; Chang, Nien Yin  
Univ of Colo, Boulder  
Proc Symp Rock Mech 21st, Rock Mech. A State of the Art, Univ of Mo, Rolla, May 28-30 1980. Publ by Univ of Mo, Rolla, 1980 p 604-614 CODEN: PSRMA6  
ISSN 0085-574X  
The results of a comprehensive analysis of some

laboratory-determined engineering properties of oil shale are presented. Twenty-nine distinct engineering properties were studied, including common physical and mechanical properties obtained in uniaxial, triaxial, Brazilian tensile, and modulus of rupture tests, and Mohr-Coulomb strength parameters obtained for individual specimens using multiple-state-triaxial testing techniques. Presented here are general statistical and distributional characteristics of some engineering properties, correlations between various properties and several easily obtainable or readily available properties, and several significant bivariate and multiple regression equations for predicting various properties. 11 refs.  
DESCRIPTORS: \*OIL SHALE, (ROCK MECHANICS, Mathematical Models), STATISTICAL METHODS.  
CARD ALERT: 505, 512, 483, 922

1182076 ID NO. - E1811082076  
**STABILITY AND SETTLEMENT OF EMBANKMENTS ON SOFT BANGLKOK CLAY.**

Balasubramaniam, A. S.; Sivandran, C.; Ho, Y. M.  
Asian Inst of Technol, Bangkok, Thailand  
Numer Methods in Geomech Aachen 1979. Proc of the Int Cont, 3rd, v 4. Addit Contrib Aachen, Ger., Apr 2-6 1979 Publ by A. A. Balkema, Rotterdam, Neth, 1980 p 1373-1411  
The paper summarizes an extensive study carried out on Soft Bangkok Clay related to the strength and compressibility characteristics as well as the stability and settlement characteristics of full scale test embankments. A comprehensive series of triaxial compression tests were carried out, and the results were compared with the predictions from a number of stress-strain theories. A statistical analysis of the strength and compressibility characteristics was also carried out. The uncertainties found in compressibility parameters validate the preference of the probability approach to other deterministic methods of evaluating settlement predictions. This approach introduces a new dimension of reliability into settlements. Refs.  
DESCRIPTORS: (\*EMBANKMENTS, Foundations), CLAY, (SOIL MECHANICS, Stability), (FOUNDATIONS, Settlement), PROBABILITY.  
CARD ALERT: 483, 405

to one-dimensional bodies under uniform tensile loading. Concepts of survival statistics are used to account for spatially random fracture nucleation. Fragment size distribution curves for both brittle and ductile fracture are derived, and the curve for the latter is compared with experimental data. Fragment distribution curves are shown to depend on both material deformation properties and loading conditions. 30 refs.  
DESCRIPTORS: \*ROCK MECHANICS.  
CARD ALERT: 483, 502

1152701 ID NO. - E1810652701  
GENERAL CRITERIA FOR THE VALIDITY OF THE BUCKINGHAM-DARCY FLOW LAW.

Sposito, Garrison  
Univ of Calif, Riverside  
Soil Sci Soc Am J v 44 n 6 Nov-Dec 1980 p 1159-1168  
CODEN: SSSJ04  
ISSN 0361-5995

A detailed, first-principles study is undertaken on the exact equation of linear momentum balance for water in an unsaturated soil. It is shown that an approximate momentum balance equation, presented originally by P. A. C. Raats and A. Klute, can be used to demonstrate unequivocally that the flow of water through a rigid, homogeneous, isotropic, unsaturated soil will obey the Buckingham-Darcy law within  $10^{-2}$  to  $10^{-1}$  sec after a gradient in the total potential of soil water has been applied. An exact equation of motion for the Fourier component of the water mass flux density vector is derived using methods in nonequilibrium statistical mechanics. This exact equation is employed to deduce the general physical criteria required for the Raats-Klute equation to be an accurate expression. 30 refs.

DESCRIPTORS: (\*SOILS, \*MOISTURE), (\*FLOW OF WATER, Underground), MATHEMATICAL MODELS, SOIL MECHANICS, IDENTIFIERS UNSATURATED SOILS  
CARD ALERT: 483, 631, 921, 931

1161011 ID NO. - E1810761011  
ANALYSIS OF LIQUEFACTION POTENTIAL BASED ON PROBABILISTIC GROUND MOTIONS.

de Herrera, Milton A.; Zsuty, Theodore C.; Abolm, Carlos A.  
Stanford Univ, Calif  
Soils under Cyclic and Transient Loading. Proc of the Int Symp. v 2. Swansea, UK, Jan 7-11 1980 Publ by A. A. Balkema, Rotterdam, Neth, 1980 p 517-521

This paper addresses itself to an aspect of liquefaction analysis which is of critical importance. The number of cycles at some stress level required to cause initial liquefaction is used and extends the methodology developed by T. C. Zsuty and M. A. de Herrera, together with the Palmgren-Miner damage hypothesis to study this facet of liquefaction.  
DESCRIPTORS: \*SOIL MECHANICS, (\*SEISMIC WAVES, Spectrum Analysis), STRESSES, PROBABILITY,  
IDENTIFIERS GROUND MOTION, LIQUEFACTION, COHESIONLESS SOILS  
CARD ALERT 483, 931, 484

1160417 ID NO. - E1810760417  
SEISMOLOGICAL INTERPRETATION OF JOINT TRACE DATA: INFLUENCE OF JOINT SHAPE AND IMPLICATIONS FOR GEOLOGICAL SURVEYS.

Warburton, P. M  
CSIRO, Mount Waverley, Victoria, Aust  
Int J Rock Mech Min Sci Geomech Abstr v 17 n 6 Dec 1980 p 305-316  
CODEN: IRMG8G

The paper presents a new statistical model for the geometrical and spatial distributions of joints, incorporating a joint shape based on the parallelogram. The model is linked with geological surveys by analytical predictions of trace patterns, covering area and line sampling, distributions of trace lengths and spacings, and allowance for truncation. Care is taken to express the equations in suitable forms for numerical evaluation. The predicted trace patterns are examined over the full range of exposure orientations and are shown to be generally consistent with reported observations. Implications for geological surveys are discussed in some detail, together with ways of obtaining the parameters of the model from field data. 10 refs.

DESCRIPTORS: (\*ROCK MECHANICS, \*Mathematical Models), GEOLOGY, Engineering, GEOLOGICAL SURVEYS,  
IDENTIFIERS ROCK JOINTS  
CARD ALERT 483, 502, 481, 922

1160415 ID NO. - E1810760415  
FRAGMENTATION OF SOLIDS UNDER IMPULSIVE STRESS LOADING

Grady, D. E  
Sandia Lab, Albuquerque, NM  
J Geophys Res v 86 n B2 Feb 10 1981 p 1047-1054  
CODEN: JGREA7  
ISSN 0022-1406

An analysis of fragmentation due to dynamic stress loading is presented which provides analytic functions for the distributions in fragment sizes. The analysis is restricted

1152678 ID NO E1810652678  
**MODEL FOR SOIL BEHAVIOR UNDER MONOTONIC AND CYCLIC LOADING CONDITIONS.**

Dafalias, Y. F.  
 Univ of Calif, Davis  
 Trans Int Conf Struct Mech React Technol 5th, v K(a) Seism Response Anal of Nucl Power Plant Syst, Berlin, Ger, Aug 13 17 1979 Publ by North-Holland Publ Co, Amsterdam, Neth for Comm of the Eur Communities, Brussels, Belg, 1979 Pap K 1, B, 9 p  
 A mathematical model capable of describing the soil behavior under any loading conditions, monotonic or cyclic, is presented within the framework of critical state soil mechanics. The soil is considered as an elasto-plastic material without a purely elastic range. Therefore, the concept of the yield surface is completely abandoned and instead the concept of the bounding surface in stress space is introduced, within or on which the stress state always lies.  
 11 refs

DESCRIPTORS (-SOIL MECHANICS, \*Research), MATHEMATICAL STATISTICS.  
 CARD ALFRI 483, 931, 922

1152676 ID NO E1810652670  
**MEASUREMENT AND COMPARISON OF SOIL STRUCTURES**

Hewitt, J. S.; Dexter, A. R.  
 Waite Agric Res Inst, Glen Osmond, South Aust, Aust  
 Appl Math Modelling v 5 n 1 Feb 1981 p 2-12 CODEN AMMODI  
 ISSN 0307 904X

A model is established to describe the structures of tilled soils using Markov chain theory. The effectiveness of the model in describing soil structures, and its accuracy when the model parameters are determined from limited field data, is investigated by a consideration of variances of the transition probabilities and Markov chain state occurrences in finite length chains. Criteria for correlation of soil structures at small horizontal and vertical displacements are derived, in order to establish distances at which soil structures become effectively independent. In this, a mathematical analysis is made of limiting covariances, generally applicable to the type of Markov chain used in describing these structures, in order to reduce drastically computing time in processing field data. Similarity coefficients are defined from the theory to measure similarity in different soil structures, and are compared in practice. 11 refs.

DESCRIPTORS (-SOIL MECHANICS, \*Analysis), SOILS, Measurements), (AGRICULTURAL ENGINEERING, Research), (PROBABILITY, Random Processes).  
 IDENTIFIERS MARKOV CHAINS, TILLED SOILS  
 CARD ALERT 483, 931, 922, 947, R21, 901

1152669 ID NO E1810652669  
**STEADY STATE OF DEFORMATION**

Phillips, Steve J.  
 Geotech Eng Inc, Winchester, Mass

ASCE J Geotech Eng Div v 107 n 5 May 1981 p 553-562  
 CODEN AJGEB6  
 ISSN 0093-6400

The steady state of deformation for any mass of particles is that state in which the mass is continuously deforming at constant volume, constant normal effective stress, constant shear stress, and constant velocity. The steady state of deformation is achieved only after all particle orientation has reached a statistically steady-state condition and after all particle breakage, if any, is complete, so that the shear stress needed to continue deformation and the velocity of deformation remain constant. The similarities and differences between steady-state deformation and the current use of the term critical state are described. A special undrained triaxial test on a sand is presented to demonstrate clearly that a special flow structure exists during steady-state deformation, which is quite different from the initial structure, and which is credited to a nonrandom, l. e., statistically oriented, arrangement of the sand grains. 15 refs.

DESCRIPTORS \*SOIL MECHANICS, SAND AND GRAVEL, (SOILS, Testing), IDENTIFIERS DEFORMATION, RESIDUAL SHEAR STRENGTH  
 CARD ALERT 483, 931

1149341 ID NO. E1810648003  
**STATISTICAL STUDY OF UNIFORM CYCLES IN EARTHQUAKES**

M. J. Wilson, R. Tang, Wilson H.  
Univ. of Illinois, Urbana  
ASCE J. Geotech. Eng. Div. v 107 n 5 May 1981 p 577-589  
CODEN AJGEB6  
ISSN 0093-6405

The applicability of equivalent uniform stress cycles in soil dynamics to the study of soil behavior during and after an earthquake is explored. The actual irregular time histories produced by an earthquake can be represented by uniform amplitude cyclic stresses, although there may be a considerable amount of uncertainty associated with them. The stress level of 75 percent of the maximum is suggested for such conversion, since in this case the uncertainty in the normalized soil-strength curve has a minimum effect on the value of the  $N/S/e//q$  versus  $M$  relationship. A statistical relationship between  $N/S/e//q$  and the earthquake magnitude is proposed here based on results available in the literature. The  $N/S/e//q$  could be estimated adequately by considering the component of excitation containing the peak acceleration. The  $N/S/e//q$  versus  $M$  relationship proposed is somewhat different from the relationship suggested by Seed and Idriss. This discrepancy in  $N/S/e//q$  values may not yield significant differences in estimating the soil strength in a liquefaction study. 33 refs.  
DESCRIPTORS: EARTHQUAKES. (SOIL MECHANICS. MATHEMATICAL MODELS). DYNAMICS. VIBRATIONS. STATISTICAL METHODS.  
CARD ALERT 484, 483, 931, 921, 922

1144789 ID NO. E1810544789  
**STOCHASTIC MODEL OF THE CREEP OF SOILS.**

Rusch, R. P., Feltham, P.  
Univ. of Lulea, Sweden  
Geotechnique v 30 n 4 Dec 1980 p 497-506 CODEN: GTNQAR  
ISSN 0950-8505  
A statistical model embodying changes in the spectrum of activation energies is outlined. With usual conditions of testing, it yields a linear relation between the creep strain and the logarithm of time. The model is shown to account well for creep behavior of undrained clay, and to provide an appropriate framework for the representation and study of the creep of structurally sensitive clay and clayey silt, as well as for less sensitive soils. The determination of the most probable activation energy in the spectrum is discussed. 15 refs.  
DESCRIPTORS: (SOIL MECHANICS. MATHEMATICAL MODELS). MATERIALS. Creep. (STRAIN, Analysis). CLAY. STATISTICAL METHODS.  
CARD ALERT 483, 931, 921, 421, 922

1142659 ID NO. E1810542659  
**PROBABILISTIC EVALUATION OF PENETRATION RESISTANCES.**

Tang, Wilson H.

Univ. of Ill., Urbana  
Nor Geotek Inst Publ n 131 1980 19 p CODEN: NGIFRZ  
ISSN 0078-1193

The paper presents a probabilistic model formulated to predict the penetration resistance and unbalanced moment encountered during the installation of a gravity platform. The uncertainties considered include the inherent spatial variability of soil resistances, location of the installed platform, limited number of cone penetration tests over the base of the platform, and calibration error thereof. Both horizontal and sloping seabed have been treated. The validity of the proposed model appears to be substantiated from the reasonable agreement between the predicted penetration resistance and unbalanced moment and those actually observed at two sites studied.  
DESCRIPTORS: (OFFSHORE STRUCTURES. FOUNDATIONS). (SOIL MECHANICS. Mathematical Models). (SOILS. Mechanical Properties). PROBABILITY.  
IDENTIFIERS: CONCRETE GRAVITY STRUCTURES  
CARD ALERT 674, 483, 922

1136119 ID NO. E1810436119  
**PROBABILISTIC EVALUATION OF LOADS**

Tang, Wilson H.  
Univ. of Ill., Urbana  
ASCE J. Geotech. Eng. Div. v 107 n 3 May 1981 p 287-304  
CODEN AJGEB6  
ISSN 0093-6405

The loads that effect geotechnical designs are reviewed, characterizing the uncertainties in each load component. Probabilistic models for evaluating each component are examined. Whenever data are available, the level of variabilities and uncertainties associated with the effect of each component on the foundation is assessed. Satisfactory performance of a geotechnical system relies, in part, on a good understanding of the characteristics of the loads and environments to which the system is subjected. Uncertainties do exist in these factors. For dynamic loads due to earthquake excitation and wave action, both their magnitude and frequencies of occurrences over the expected duration of the system could not be known. The long-term stability of soil slope would also be dependent on stochastic fluctuation of the pore pressure due to seasonal variation and other temporal changes in the environment. 36 refs.  
DESCRIPTORS: (SOIL MECHANICS. Mathematical Models). STATISTICAL METHODS. PROBABILITY. FOUNDATIONS. Soil Structure Interaction).

IDENTIFIERS: EARTH PRESSURE  
CARD ALERT: 483, 931, 921, 922, 405

1125938 ID NO. - E1810325R38  
**POAC 79. INTERNATIONAL CONFERENCE ON PORT AND OCEAN ENGINEERING UNDER ARCTIC CONDITIONS, 5th, PROCEEDINGS, 1979.**  
Arctic

Univ of Trondheim, Norw Inst of Technol  
POAC 79. Int Conf on Port and Ocean Eng Under Arctic Cond.  
5th, Proc. Univ of Trondheim, Norw Inst of Technol, Aug 13-18  
1979 Publ by Univ of Trondheim, Norw Inst of Technol, 1979 3  
vol 2n22 p

This conference proceedings contains 86 papers. Eighty papers are indexed separately. Topics covered include interaction between ice and shore; pack ice and icebergs; remote surveillance and instrumentation technology; environmental aspects; oceanography and meteorology; wave mechanics and statistics; ice properties and their testing; soil mechanics; marine structures; oil spills; and harbor and marine protective structures.  
DESCRIPTORS: \*OCEAN ENGINEERING, \*OFFSHORE STRUCTURES, (OIL WELL DRILLING, Offshore), \*PETROLEUM PROSPECTING, OCEANOGRAPHY, ICE.  
CARD ALERT: 472, 674, 511, 512, 471, 481

1123557 ID NO - E1810323557  
**DEPENDENCE OF THE FOURIER AMPLITUDE SPECTRA OF STRONG MOTION ACCELERATION ON THE DEPTH OF SEDIMENTARY DEPOSITS.**  
Trifunac, Mihailo D.; Lee, Vincent W

Rep Univ South Calif Dep Civ Eng n 78-14 Dec 1978 39 p (OPEN RUS00)  
The report presents an improvement in empirical scaling of Fourier spectrum amplitudes of strong motion earthquake accelerations by introducing the frequency dependent effects of local geologic conditions, characterized by the depth of sediments beneath the recording station. Equations presented lead to smaller spread of data about the empirical models than previous related empirical scaling of Fourier spectrum amplitudes. Simplified statistical tests on the significance of chosen parameters and of the regression equations show significant increase in spectral amplitudes with the depth of sediments for periods longer than about 1 second. For high frequencies, this trend is reversed, but small.  
DESCRIPTORS: (\*GEOPHYSICS, \*Seismic), (SOIL MECHANICS, Mathematical Models), SEISMIC WAVES, EARTHQUAKES, SEDIMENTATION.  
IDENTIFIERS: EARTHQUAKE ACCELERATIONS  
CARD ALERT: 481, 484, 483, 931, 921

1119559 ID NO. - E1810219559  
**SOME ASPECTS OF THE BEHAVIOR OF TUNNELS THAT CROSS ACTIVE FAULTS.**  
Brown, J. S.; Blakey, T. L.  
Univ of Calif, Berkeley

Aust - NZ Conf on Geomech, 3rd, v 2, Wellington, NZ, May 12-16 1980. Publ by NZ Inst of Eng (Proc of Tech Groups, v 6 Issue 1(6)), Wellington, 1980 p 2 189-2, 194

Active faults are mapped as nearly linear features, and are often crossed by civil engineering structures. The classification of a fault as active implies a probability that fault slippage will cause damage to structures that cross it. This paper describes the problems that arise when a tunnel is located across an active fault, and some design solutions are suggested. The Bay Area Rapid Transit (BART) Berkeley Hills tunnels that cross the active Hayward Fault in California are used as a case study. Among the points covered are active fault phenomena that can affect a tunnel, the effect of fault creep on tunnels, and instrumenting high risk areas to detect potentially damaging changes in loading and deformation.  
DESCRIPTORS: \*TUNNELS AND TUNNELING, (GEOLOGY, Engineering), ROCK MECHANICS, GEOLOGICAL FAULTS  
CARD ALERT: 401, 481, 483

1117812 ID NO. - E1810217812  
**APPLICATION OF VARIOUS ROCK MASS CLASSIFICATIONS TO UNSUPPORTED OPENINGS AT MOUNT ISA, QUEENSLAND: A CASE STUDY.**  
Baczynski, N. R. PL.  
CSIRO, Aust

Aust - NZ Conf on Geomech, 3rd, v 2, Wellington, NZ, May 12-16 1980. Publ by NZ Inst of Eng (Proc of Tech Groups, v 6 Issue 1(6)), Wellington, 1980 p 2 137-2, 143  
A number of published rock mass classification systems are applied to the assessment of unsupported openings within the dolomitic shales at the Mount Isa Mine in Australia. A statistical model for local variability in the intensity of fracturing within the shales serves as a basis for the structural data input. Results of the analysis are presented and limitations of the classification systems are discussed. Possible improvements in the systems are suggested.  
DESCRIPTORS: \*ROCK MECHANICS, (MINES AND MINING, Tunneling), SHALE, Fracture.  
IDENTIFIERS: ROCK MASSES, CLASSIFICATION SYSTEMS  
CARD ALERT: 483, 502, 481

rainfall indices to define the soil water status preceding each daily rainfall. These thresholds are used to compare terrain sensitivity and to assess the probability of landslide occurrence.

DESCRIPTORS \*LANDSLIDES, PROBABILITY, SOIL MECHANICS, RAIN AND RAINFALL, (SOILS, MOISTURE), IDENTIFIERS SOIL WATER, CARD ALERT 483, 484, 922

1114269 ID NO. E1810214269  
**CASE FOR TERRESTRIAL PHOTOGRAMMETRY IN DEEP-MINE ROCK STRUCTURE STUDIES.**

Hagan, T. O.  
 Int J Rock Mech Min Sci Geomech Abstr v 17 n 4 Aug 1980 p 191-198 CODEN IRMGRC

A method of rock fracture orientation mapping by photogrammetric means is detailed. The technique is particularly useful for statistical studies of fracture patterns in the often confined and uncomfortable underground environment. The advantages of convenience, efficiency and high accuracy of dip and dip direction measurements are stressed. Sections are devoted to the background theory of terrestrial photogrammetry, a description of the unsophisticated photographic equipment used and the actual procedure, which involves certain external control measures. Photo-interpretation, data entry and processing, with the aid of a stereoscope, digitizer and mini-computer, are outlined. Two sources of error are analyzed.

DESCRIPTORS \*GEOLOGICAL SURVEYS, PHOTOGRAMMETRY, (ROCK MECHANICS, Research), MINES AND MINING, CARD ALERT 481, 483, 742

DIAGLOG FILE COMPENEX : 70-R2/AUG (Copr. Engineering Information Inc.)

1117808 ID NO. E1810212808  
**STEREOLOGICAL INTERPRETATION OF JOINT TRACE DATA.**

Wainwright, P. M.  
 CSIRO, Melbourne, Victoria, Aust.  
 Int J Rock Mech Min Sci Geomech Abstr v 17 n 4 Aug 1980 p 181-190 CODEN IRMGRC

A statistical model of joints is used to derive analytical predictions of the patterns of traces observed in geological surveys. The derivations are carried out for both area and line sampling and cover the distributions of trace lengths and spacings, including allowance for truncation. An application to rock bolting is also described. The equations are converted, where necessary, to forms that facilitate numerical evaluation. An example illustrates how the parameters of the model may be obtained from field data. 24 refs.

DESCRIPTORS \*ROCK MECHANICS, (GEOLOGY, Engineering), MATHEMATICAL MODELS, ROCK JOINTS, IDENTIFIERS ROCK, 507, 481, CARD ALERT 483, 507, 481

1117799 ID NO. E1810217799  
**ZONAL CONCEPT FOR SPATIAL DISTRIBUTION OF FRACTURES IN ROCK.**

Baczynski, R. P.  
 Univ of Melbourne, Aust.  
 Aus NZ Conf on Geomech, 3rd, v 2, Wellington, NZ, May 12-16 1980 publ by NZ Inst of Eng (Proc of Tech Groups, v 6 Issue 1(G)), Wellington, 1980 p 2 29-2, 33

Evaluation of the spatial distribution of fractures within the dolomitic shales at the Mount Ica Mine in Australia suggests that fractures tend to occur in zones. Computer modeling of fracture distributions indicates that the field mapping technique of single line sampling fails to provide sufficient data to fully characterize the rock mass. A simple data collection model formulation concept is described that will enable the local variability within any rock mass to be assessed. The method permits the statistical evaluation of masses in terms of fracture intensities of each set that is likely to be associated with underground openings of any given shape and size.

DESCRIPTORS (\*ROCK, \*Fracture), (GEOLOGY, Engineering), STATISTICAL METHODS, MATHEMATICAL MODELS, ROCK MECHANICS, IDENTIFIERS ROCK MASSES, CARD ALERT 483, 481

1115208 ID NO. E1810215208  
**ASSESSING THE PROBABILITY OF RAPID MASS MOVEMENT.**

Crozier, M. J.; Fyfe, R. J.  
 Victoria Univ of Wellington, NZ  
 Aus NZ Conf on Geomech, 3rd, v 2, Wellington, NZ, May 12-16 1980 publ by NZ Inst of Eng (Proc of Tech Groups, v 6 Issue 1(G)), Wellington, 1980 p 2 47-2, 51

Threshold conditions required to induce landsliding on Ottago peninsula and in Wellington City in New Zealand are identified by employing water balance calculations and antecedent

ISSN 0013-7952  
A method of probabilistic analysis of three-dimensional limit equilibrium stability of long earth slopes is presented and its application to earth embankment design is discussed. The method accounts for the spatial variability of the shear strength. It is in principle capable of accommodating frictional and cohesive components of shear strength as well as a spectrum of drainage conditions. The probabilistic model predicts that slope failure events involving very long or very short widths of the failure zone are highly improbable. The paper evaluates the probability of a sliding failure at a specific location, as well as the risk that a failure will occur anywhere along a slope of given total length. Refs. DESCRIPTORS: (\*SOIL MECHANICS, \*Stability), PROBABILITY, EMBANKMENTS, Design), (SOILS, Shear Strength), DRAINAGE. IDENTIFIERS: SLOPE STABILITY, STABILITY ANALYSIS. CARD ALERT: 483, 931, 922

1108241 ID NO. - E1810108241  
**SEISMIC ANALYSIS OF SLOPES IN THE NORTHEAST U. S. A.**  
Athanasios-Grivas, Dimitri  
Rensselaer Polytech Inst, Troy, NY  
Symposium on Earthquake Eng, 6th, v 1, Univ of Roorkee, India, Oct 5-7 1978 Publ by Sarita Prakashan, Meerut, India p 157-161  
The probability distribution of the earthquake magnitude is obtained with the aid of a log-linear magnitude-recurrence relation and its dependence on the numerical values of the regional parameters is investigated. An upper and lower bound for the magnitude are considered. The statistical values and probability distribution of the maximum ground acceleration are also determined. An "left double quote" error term "right double quote" is introduced to improve the correspondence between observed and computed values. In a case study, the dependence is examined of the safety of a soil slope on the choice of the attenuation relation, the numerical values of regional parameters, and the distance between the earthquake source and the site of the slope. DESCRIPTORS: (\*SOIL MECHANICS, \*Stability), EARTHQUAKES, PROBABILITY, DYNAMICS. IDENTIFIERS: SOIL DYNAMICS, SEISMIC ANALYSIS. CARD ALERT: 483, 931, 484, 922

1114075 ID NO. - E1810214075  
**ULTIMATE LOAD FOUNDATION DESIGN USING STATISTICALLY BASED FACTORS.**  
McAnally, P. A.  
Queensl Inst of Technol, Aust  
Aust NZ Conf on Geotech, 3rd, v 2, Wellington, NZ, May 12-16 1980 Publ by NZ Inst of Eng (Proc of Tech Groups, v 6 Issue 1(G)), Wellington, 1980 p 2, 227-2, 232  
The results of pile load tests are presented from various sites in stiff fissured clays, with a statistical model of soil response to foundation load. The significance of some deviations in observed pile performance from conditions commonly assumed in design is tested by means of this model. It is shown that the model allows the evaluation of a material response factor for ultimate load design of foundations, and a design example is given. DESCRIPTORS: (\*FOUNDATIONS, \*Piles), (SOIL MECHANICS, Mathematical Models), (PILES, Testing). CARD ALERT: 405, 483, 931

1108283 ID NO. - E1810108283  
**LIQUEFACTION STUDY SEM DASHES A DECISION ANALYSIS FRAMEWORK**  
Halqan, Achimlyn  
Ga Inst of Technol, Atlanta  
ASCE J Geotech Eng Div v 106 n 12 Dec 1980 p 1297-1312  
CODEN: AJGEB6  
ISSN 0093-6405  
A decision analysis framework is developed here to study the liquefaction problem. When the liquefaction risk of a site is found to be unacceptable, several alternatives could be attempted. However, economic as well as technical aspects need to be considered in selecting the best solution. This type of study would be particularly helpful if the limitation or elimination of damage associated with liquefaction is a design criterion. In this paper, several design alternatives for a liquefaction study have been identified and a decision tree is used to organize essential information. A decision can be made with available information or with additional information if additional time and money are available. Collection of additional information may not be always desirable for all projects. It depends on many factors and they are identified here. If the additional information is desirable, the maximum amount of money that should be spent can also be estimated from this study. 37 refs. DESCRIPTORS: (\*SOILS, \*Moisture), SOIL MECHANICS, SAND AND GRAVEL, STATISTICAL METHODS. IDENTIFIERS: LIQUEFACTION. CARD ALERT: 483, 931, 922

1108243 ID NO. - E1810108243  
**PROBABILISTIC STABILITY ANALYSIS OF EARTH SLOPES.**  
Vanmarcke, E. H.  
MIT, Cambridge, Mass  
Eng Geol v 16 n 1-2 Jul 1980 p 29-50 CODEN: EGGQAO

110730 ID NO - E1810107360  
**PROBABILISTIC SEISMIC STABILITY ANALYSIS SEM DASHES A CASE STUDY**

Atkinson Gravas, D  
Rensselaer Polytech Inst, Troy, NY  
Can Geotech J v 17 n 3 Aug 1980 p 353-61. CODEN: CGJDAH  
ISSN 0008 3674

A previously developed model is used to provide a probabilistic seismic stability analysis for a natural slope located near Singu Islands, New York. The safety of the slope is measured in terms of its probability of failure rather than the customary factor of safety. Three types of possible earthquake sources are investigated, namely, a point, a line, and an area source. The dependence on significant seismic parameters of the probability of failure of the slope is examined and the results are presented in a number of graphs and tables. Refs

DESCRIPTORS: (\*SOIL MECHANICS, \*Stability), EARTHQUAKE RESISTANCE, PROBABILITY, FAILURE ANALYSIS.  
IDENTIFIERS: SEISMIC STABILITY, SLOPE STABILITY  
CARD ALERT 483, 931, 922

1107360 ID NO - E1810107360  
**RELIABILITY OF RETAINING STRUCTURES DURING EARTHQUAKES.**

Rensselaer Polytech Inst, Troy, NY  
Sym on Earthquake Eng, 6th, v 1, Univ of Roorkee, India, Oct 5-7 1978 Publ by Sarita Prakashan, Meerut, India p 265-270  
The paper reports on a study to provide an expression for the pressure acting on a retaining wall during an earthquake, and to determine the probability of failure of the wall through an application of the combinatorial reliability analysis. The distribution of the pressure along a wall during an earthquake is derived through a quasi-static analysis and with the aid of the 'left double quotes' method of redistribution of pressure (right double quotes). The safety of the wall is measured in terms of its probability of failure rather than the customary factor of safety. Four possible modes of failure are considered: overturning, base sliding, failure in bearing capacity and overall sliding. The value of the total probability of failure is then found through a combinatorial reliability analysis. The developed analysis is applied in a case study. Refs

DESCRIPTORS: (\*RETAINING WALLS, \*Earthquake Resistance), RELIABILITY, SOIL MECHANICS, (PROBABILITY, FAILURE).  
IDENTIFIERS: SOIL DYNAMICS, SOIL SEISMIC PRESSURE  
CARD ALERT 405, 484, 483, 971

1085991 ID NO - E1801185991  
**IDENTIFICATION OF A ONE-DIMENSIONAL MODEL FOR A SOIL-LAYER-BEDROCK SYSTEM DURING AN EARTHQUAKE.**

Tomizawa, Minoru  
Sci Univ of Tokyo, Noda, Jpn  
Earthquake Eng Struct Dyn v 8 n 3 May-Jun 1980 p 251-265

CODEN: JLEP85  
ISSN 0070 6247

The propriety of adopting a multi-degree-of-freedom lumped mass spring-damper system driven by white noise support excitation as a one dimensional model for a soil-layer-bedrock system during an earthquake is investigated by means of statistical system identification of the model with noisy measurement of the earthquake ground velocity. The present discussion also suggests that this model may not be applicable to all observed earthquake records, since the model itself depends on the statistical nature of the earthquake motion. For appropriate earthquake records, the system identification procedure may be accomplished; then dynamical properties of the soil-layer and the power spectral density for white noise excitation acting upon the bedrock can be estimated as shown in a numerical example. 15 refs.

DESCRIPTORS: \*SOIL MECHANICS, EARTHQUAKES, MATHEMATICAL MODELING.  
IDENTIFIERS: SOIL LAYER-BEDROCK SYSTEMS  
CARD ALERT 483, 931, 484, 922

1085569 ID NO - E1801185569  
**ON THE PROBABILITY DISTRIBUTION OF FAILURE LIFE OF ROCK UNDER CONSTANT TENSILE STRESS.**

Nishimatsu, Yuichi; Yamaguchi, Tsutomu  
Univ of Tokyo, Jpn  
Zairyo v 29 n 317 Feb 1980 p 197-197 CODEN: ZARYAQ  
ISSN 0514-5163

The failure lives of rock were observed under constant uniaxial tensile stress, and the results were analyzed on the assumption that the failure process of rock is a stochastic process. When the logarithms of probability of survival were plotted against failure lives, a curve opening upwards was obtained on probability-time (p-t) diagram. This upwards concave curve on p-t diagram means that the failure process is neither serial nor cumulative, but consists of parallel Poisson's processes of first order. It is suggested that this upwards concave curve is caused from the stochastic dispersion of the rate constant of failure by various factors, rather than the coexistence of a few parallel failure processes with infinitely different rate constants of failure. Based on the test results, the probability distribution of the rate constant of failure was graphically analyzed, and expressed as a discrete distribution of four rate constants. 10 refs. In Japanese

DESCRIPTORS: (\*ROCK, \*Failure), PROBABILITY, MATERIALS TESTING, Tensile Tests), ROCK MECHANICS.  
IDENTIFIERS: FAILURE LIFE, STOCHASTIC PROCESSES  
CARD ALERT 483, 421, 922

1085567 ID NO. - E1801185567  
**DISCONTINUITIES AND ROCK MASS GEOMETRY.**  
 Hudson, J. A.; Priest, S. D.  
 Dep of Environ & Transp. London, Engl  
 Int J Rock Mech Min Sci Geomech Abstr v 16 n 6 Dec 1979 p  
 339-362 CODEN: IJRMGR

Variation in discontinuity frequency as a function of scanline orientation in a plane is studied for rock masses containing sets of discontinuities. The spacing values between discontinuity intersection points that can occur along such scanlines are considered in order to develop a probability density distribution of block lengths. The ideas are extended to block area and volume distributions synthesized from the products of discontinuity spacing values along two and three axes respectively. Such distributions are also considered for rock masses where each discontinuity occurs with a random orientation. Histograms of discontinuity spacing and block area values compiled from measurements made on a variety of rock exposures are in general agreement with the theoretical distributions. 10 refs.

DESCRIPTORS: \*ROCK, PROBABILITY, (GEOLOGY, Engineering), ROCK MECHANICS, IDENTIFIERS, ROCK MASS GEOMETRY, DISCONTINUITIES, BLOCK LENGTHS  
 CARD ALERT 483, 502, 922

1078653 ID NO. - E1801078653  
**DESIGN METHOD OF DEEP EXCAVATION IN COHESIVE SOIL BASED ON THE RELIABILITY THEORY.**  
 Matsuo, Minoru; Kawamura, Kumio  
 Nagoya Univ, Jpn  
 Soils Found v 20 n 1 Mar 1980 p 61-75 CODEN: SOIFBE  
 ISSN 0038-0806

A design method, based on the reliability theory is applied to the design of large-sized excavation works. The optimization of the prior design before construction is described. The method to decide the optimal action in the prior design is discussed based on the statistical properties of soils and the analytical error of the conventional design equations. The obtained optimal solutions are compared with the actual results of the past construction fields. In the second half of this paper, the dynamic design procedure in which the results of the prior design are modified by new information obtained during construction is applied to the excavation problem. 12 refs.

DESCRIPTORS: (\*SOIL MECHANICS, \*Mathematical Models), EXCAVATION, OPTIMIZATION, STATISTICAL METHODS, IDENTIFIERS, COHESIVE SOIL, RELIABILITY THEORY  
 CARD ALERT 483, 931, 405, 922

1071933 ID NO. - E1800971933  
**COMPUTATION AND ANALYSIS OF PROBABILISTIC CHARACTERISTICS OF STRESSES NEAR UNDERGROUND OPENING IN STOCHASTICALLY INHOMOGENEOUS ROCK MASS.**

Gheinin, V. I  
 Res Inst of Bases & Underground Struct, Moscow, USSR  
 Numer Methods in Geomech Aachen 1979, Proc of the Int Conf, 3rd, v 2, Aachen, Ger, Apr 2-6 1979 Publ by A. A. Balkema, Rotterdam, Neth, 1979 p 663-669

A solution to the stress concentration problem for a circular hole in an elastic plane with irregular heterogeneity is given. Fourier expansions for stress distribution cover the hole boundary and for its correlation function are presented. An algorithm to compute the correlation function using recurrent techniques for calculation of the special function involved is given in detail. The relationship of computed values based on the ratio of hole radius to the specific dimension of inhomogeneities is found and studied. The results yield a simple approximation of the computed function which can be used in practice. Refs.

DESCRIPTORS: (\*TUNNELS AND TUNNELING, \*Stresses), PROBABILITY, ROCK MECHANICS, IDENTIFIERS, UNDERGROUND OPENINGS, \*ROCK MASSES  
 CARD ALERT 401, 483, 922

1071135 ID NO. - E1800971135  
**PATH OF FLOW AND ITS EFFECT ON CONSOLIDATION RATES.**  
 Athanasiou-Grivas, Dimitri; Harr, Milton F.  
 Rensselaer Polytech Inst, Troy, NY  
 Numer Methods in Geomech Aachen 1979, Proc of the Int Conf, 3rd, v 1, Aachen, Ger, Apr 2-6 1979 Publ by A. A. Balkema, Rotterdam, Neth, 1979 p 125-131

A probabilistic model is presented for the determination of the time rate of pore pressure (in excess of hydrostatic) dissipation through a compressible soil layer. The pore water flow is treated as a 1st order random walk with double quotes process. The similarity between flow paths and configurations of polymer chains is exploited to determine the probability density function of the total length of flow lines. Differences between the laboratory and field flow conditions are examined and predictions are made of the expected rates of dissipation of pore water pressure for the latter. Refs.

DESCRIPTORS: (\*SOIL MECHANICS, \*Pore Pressure), (SOILS, Consolidation), MATHEMATICAL MODELS, PROBABILITY, (FLOW OF WATER, Porous Materials), IDENTIFIERS, PROBABILISTIC MODELS  
 CARD ALERT 483, 931, 922, 631

1071933 ID NO. - E1800971933  
**COMPUTATION AND ANALYSIS OF PROBABILISTIC CHARACTERISTICS OF STRESSES NEAR UNDERGROUND OPENING IN STOCHASTICALLY INHOMOGENEOUS ROCK MASS.**

1071121 ID NO. E1800971121  
BAYESIAN APPROACH TO INVERSE PROBLEM IN CONSOLIDATION AND ITS APPLICATION TO SETTLEMENT PREDICTION.

Asaka, Akira, Matsuo, Minoru  
Kyoto Univ, Jpn  
Numer Methods in Geomech Aachen 1979, Proc of the Int Conf. 3rd, v 1, Aachen, Ger, Apr 2-6 1979 Publ by A. A. Balkema, Rotterdam, Neth, 1979 p 115-123  
The paper discusses the inverse problem of one-dimensional consolidation equation when the observation is restricted only to the settlement behavior on the top of soil strata. The master equation of settlement-time relationship is derived from a consolidation equation as a form of linear ordinary differential equation with constant coefficients under the conditions of both increasing and constant external consolidation pressure. The master differential equation is reduced to a difference form, an autoregressive equation, which gives a suitable form to statistical parameter identification from field observation data of settlement through Bayesian analysis. The least square quantities are demonstrated to provide allowable estimators for unknown coefficients of an autoregressive equation.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Consolidation), STATISTICAL METHODS, (FOUNDATIONS, Settlement).  
CARD ALERT 483, 931, 922

1071109 ID NO. E1800971109  
NUMERICAL METHODS IN GEOMECHANICS AACHEN 1979, PROCEEDINGS OF THE INTERNATIONAL CONFERENCE, 3RD, VOLUMES 1-3, 1979.

Wittke, W (Ed)  
Univ of Aachen, Inst for Found Eng, Soil Mech, Rock Mech & Water Ways  
Numer Methods in Geomech Aachen 1979, Proc of the Int Conf. 3rd, Aachen, Ger Apr 2-6 1979 Publ by A. A. Balkema, Rotterdam, Neth, 1979 3 v, 1252 p  
The three proceedings volumes contain 126 papers presented at the Conference, 100 of which are indexed separately. The papers are grouped under general topic headings that include theoretical developments, flow and consolidation, constitutive laws (volume 1), rock behavior, underground openings, embankments and slopes, and dynamics (volume 2), soil-structure interactions in foundations and in retaining structures (volume 3). Among the mathematical techniques discussed in the papers are finite elements and finite differences, boundary integrals, matrices, mathematical modeling, statistical analysis, variational techniques, nonlinear analysis, probability, and others.  
DESCRIPTORS: \*SOIL MECHANICS, ROCK MECHANICS, (MATHEMATICAL TECHNIQUES, Numerical Methods), STATISTICAL METHODS, FOUNDATIONS, GEOLOGY, GEOMECHANICS, GEOLOGICAL MATERIALS, CONSTITUTIVE MODELS, SLOPE STABILITY, PROBABILISTIC MODELS  
CARD ALERT 483, 931, 481, 921, 922

1070232 ID NO. E1800970232  
STABILITY ANALYSIS OF ROCK SLOPES WITH RESPECT TO STATISTICAL ASPECTS.

Deutsch, R. R.  
Ruhrtaisperrerver Essen, Ger  
Numer Methods in Geomech Aachen 1979, Proc of the Int Conf. 3rd, v 2, Aachen, Ger, Apr 2-6 1979 Publ by A. A. Balkema, Rotterdam, Neth, 1979 p 791-795  
The stability of slopes in jointed rock is mainly influenced by geological discontinuities. Beside extension, spacing and strength, the most important parameter is the orientation of these planes. In order to assess the influence of discontinuities on the stability of rock slopes, in many cases the orientation mean of identified joint sets and the estimated average strength parameters can be introduced in the stability analyses. But if values deviate to a greater extent from those means, the scattering has to be considered. In this paper a method is proposed which enables stability analyses of rock slopes taking joint statistics into account.  
Refs.  
DESCRIPTORS: (\*ROCK MECHANICS, \*Stability), STATISTICAL METHODS.  
IDENTIFIERS: ROCK SLOPES, ROCK JOINTS  
CARD ALERT: 483, 502, 922

1067311 ID NO. E1800967311  
APPLICATION OF PROBABILITY THEORY TO THE FINITE ELEMENT METHOD IN PREDICTING SETTLEMENTS IN SOFT BANGKOK CLAY.

Sivandran, C.; Chiev, Khus; Balasubramaniam, A. S.  
Asian Inst of Technol, Bangkok, Thai  
Numer Methods in Geomech Aachen 1979, Proc of the Int Conf. 3rd, v 3, Aachen, Ger, Apr 2-6 1979 Publ by A. A. Balkema, Rotterdam, Neth, 1979 p 1025-1032  
The concept of probability and statistics is an approach towards quantifying in a consistent and organized manner the uncertainties involved in analysis rather than depending on safety factors. With the development of probabilistic methods, it is now possible to handle the spatial variation of soil properties, and also to determine the risks involved depending on the nature of the uncertainties. This paper reports on a study that endeavors to establish probability models for describing spatial variations of soil properties. The soil heterogeneity is simulated from these models for the finite element mesh. For this purpose, a full scale test embankment built rapidly to failure has been chosen. The embankment was built on soft Bangkok clay.  
DESCRIPTORS: (\*FOUNDATIONS, \*Settlement), PROBABILITY, CLAY, SOIL MECHANICS, (MATHEMATICAL TECHNIQUES, Finite Element Method).  
CARD ALERT: 405, 483, 922

1065667 ID NO. - E1800965667  
**PHYSICAL CLAY CREEP MODEL AND ITS MATHEMATICAL ANALOGY.**  
Pusch, R.  
Univ. of Lulna, Sweden  
Numer. Methods in Geomech. Aachen 1979, Proc. of the Int. Conf.,  
3rd, v. 1, Aachen, Ger., Apr. 2-6, 1979. Publ. by A. A. Balkema,  
Rotterdam, Neth., 1979. p. 485-492.  
Natural soft illitic clays are characterized by a  
heterogeneous microstructure. The application of a  
sufficiently high deviator stress produces translation and  
rotation of rigid aggregates in connection with the formation  
of groups of parallel flaky particles which behave as slip  
units. The movements of these units, which produce bulk creep  
strain, represent a thermally assisted passage over energy  
barriers aided by external stress. The large variation in  
barrier height suggests the use of statistical mechanics for  
the mathematical description of a plausible physical model.  
This paper presents such a model and a simplified mathematical  
analogy for undrained conditions.  
DESCRIPTORS: (-)CLAY, (+)CREEP, SOIL MECHANICS, STATISTICAL  
METHODS, MATHEMATICAL MODELS.  
CARD ALERT: 483, 421, 931, 922

1063374 ID NO. - E1800863374  
**INFORMATION THEORY APPROACH TO SLOPE STABILITY.**  
Papantonopoulos, C. I.  
Ec Polytech, Montreal, Que.  
Appl. of Stat. and Probab. in Soil and Struct. Eng., 3rd Int. Conf.  
(ICASP 3), Proc., Sydney, Aust., Jan. 29-Feb. 2, 1979. Sponsored by  
Unisearch Ltd., Kensington, NSW, Aust., 1979. v. 2, p. 466-476.  
This paper, adopting limit equilibrium methodology, shows  
how information theory can be used in order to solve the  
stress distribution decision problem. The stress distribution  
is shown to depend on an unknown probability distribution  
function. For a given rupture surface the unknown  
probability-distribution function and the corresponding factor  
of safety are uniquely determined by using the notion of  
entropy (uncertainty) as criterion for setting up prior  
probability assignments. An example problem illustrates the  
procedure and presents comparisons with other well known  
methods. 26 refs.  
DESCRIPTORS: (-)SOIL MECHANICS, (+)STABILITY, INFORMATION  
THEORY, DECISION THEORY, (STRESSES, ANALYSIS), PROBABILITY.  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 931, 922

1063375 ID NO. - E1800863375  
**SLOPE STABILITY AND THE BEARING CAPACITY OF SHALLOW  
FOUNDATIONS ON SLOPES.**  
Schultz, E.  
Tech. Hochschule Aachen, Ger.  
Appl. of Stat. and Probab. in Soil and Struct. Eng., 3rd Int. Conf.  
(ICASP 3), Proc., Sydney, Aust., Jan. 29-Feb. 2, 1979. Sponsored by  
Unisearch Ltd., Kensington, NSW, Aust., 1979. v. 2, p. 466-476.  
This paper, adopting limit equilibrium methodology, shows  
how information theory can be used in order to solve the  
stress distribution decision problem. The stress distribution  
is shown to depend on an unknown probability distribution  
function. For a given rupture surface the unknown  
probability-distribution function and the corresponding factor  
of safety are uniquely determined by using the notion of  
entropy (uncertainty) as criterion for setting up prior  
probability assignments. An example problem illustrates the  
procedure and presents comparisons with other well known  
methods. 26 refs.  
DESCRIPTORS: (-)SOIL MECHANICS, (+)STABILITY, INFORMATION  
THEORY, DECISION THEORY, (STRESSES, ANALYSIS), PROBABILITY.  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 931, 922

1063376 ID NO. - E1800863376  
**SLOPE STABILITY AND THE BEARING CAPACITY OF SHALLOW  
FOUNDATIONS ON SLOPES.**  
Schultz, E.  
Tech. Hochschule Aachen, Ger.  
Appl. of Stat. and Probab. in Soil and Struct. Eng., 3rd Int. Conf.  
(ICASP 3), Proc., Sydney, Aust., Jan. 29-Feb. 2, 1979. Sponsored by  
Unisearch Ltd., Kensington, NSW, Aust., 1979. v. 2, p. 466-476.  
This paper, adopting limit equilibrium methodology, shows  
how information theory can be used in order to solve the  
stress distribution decision problem. The stress distribution  
is shown to depend on an unknown probability distribution  
function. For a given rupture surface the unknown  
probability-distribution function and the corresponding factor  
of safety are uniquely determined by using the notion of  
entropy (uncertainty) as criterion for setting up prior  
probability assignments. An example problem illustrates the  
procedure and presents comparisons with other well known  
methods. 26 refs.  
DESCRIPTORS: (-)SOIL MECHANICS, (+)STABILITY, INFORMATION  
THEORY, DECISION THEORY, (STRESSES, ANALYSIS), PROBABILITY.  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 931, 922

1063377 ID NO. - E1800863377  
**SLOPE STABILITY AND THE BEARING CAPACITY OF SHALLOW  
FOUNDATIONS ON SLOPES.**  
Schultz, E.  
Tech. Hochschule Aachen, Ger.  
Appl. of Stat. and Probab. in Soil and Struct. Eng., 3rd Int. Conf.  
(ICASP 3), Proc., Sydney, Aust., Jan. 29-Feb. 2, 1979. Sponsored by  
Unisearch Ltd., Kensington, NSW, Aust., 1979. v. 2, p. 466-476.  
This paper, adopting limit equilibrium methodology, shows  
how information theory can be used in order to solve the  
stress distribution decision problem. The stress distribution  
is shown to depend on an unknown probability distribution  
function. For a given rupture surface the unknown  
probability-distribution function and the corresponding factor  
of safety are uniquely determined by using the notion of  
entropy (uncertainty) as criterion for setting up prior  
probability assignments. An example problem illustrates the  
procedure and presents comparisons with other well known  
methods. 26 refs.  
DESCRIPTORS: (-)SOIL MECHANICS, (+)STABILITY, INFORMATION  
THEORY, DECISION THEORY, (STRESSES, ANALYSIS), PROBABILITY.  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 931, 922

1063378 ID NO. - E1800863378  
**SLOPE STABILITY AND THE BEARING CAPACITY OF SHALLOW  
FOUNDATIONS ON SLOPES.**  
Schultz, E.  
Tech. Hochschule Aachen, Ger.  
Appl. of Stat. and Probab. in Soil and Struct. Eng., 3rd Int. Conf.  
(ICASP 3), Proc., Sydney, Aust., Jan. 29-Feb. 2, 1979. Sponsored by  
Unisearch Ltd., Kensington, NSW, Aust., 1979. v. 2, p. 466-476.  
This paper, adopting limit equilibrium methodology, shows  
how information theory can be used in order to solve the  
stress distribution decision problem. The stress distribution  
is shown to depend on an unknown probability distribution  
function. For a given rupture surface the unknown  
probability-distribution function and the corresponding factor  
of safety are uniquely determined by using the notion of  
entropy (uncertainty) as criterion for setting up prior  
probability assignments. An example problem illustrates the  
procedure and presents comparisons with other well known  
methods. 26 refs.  
DESCRIPTORS: (-)SOIL MECHANICS, (+)STABILITY, INFORMATION  
THEORY, DECISION THEORY, (STRESSES, ANALYSIS), PROBABILITY.  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 931, 922

1063379 ID NO. - E1800863379  
**SLOPE STABILITY AND THE BEARING CAPACITY OF SHALLOW  
FOUNDATIONS ON SLOPES.**  
Schultz, E.  
Tech. Hochschule Aachen, Ger.  
Appl. of Stat. and Probab. in Soil and Struct. Eng., 3rd Int. Conf.  
(ICASP 3), Proc., Sydney, Aust., Jan. 29-Feb. 2, 1979. Sponsored by  
Unisearch Ltd., Kensington, NSW, Aust., 1979. v. 2, p. 466-476.  
This paper, adopting limit equilibrium methodology, shows  
how information theory can be used in order to solve the  
stress distribution decision problem. The stress distribution  
is shown to depend on an unknown probability distribution  
function. For a given rupture surface the unknown  
probability-distribution function and the corresponding factor  
of safety are uniquely determined by using the notion of  
entropy (uncertainty) as criterion for setting up prior  
probability assignments. An example problem illustrates the  
procedure and presents comparisons with other well known  
methods. 26 refs.  
DESCRIPTORS: (-)SOIL MECHANICS, (+)STABILITY, INFORMATION  
THEORY, DECISION THEORY, (STRESSES, ANALYSIS), PROBABILITY.  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 931, 922

1063373 ID NO. - EIRO063373  
**ON THE PROBABILITY OF FAILURE OF SLOPES.**

Stoian, D.; Forster, W.; Weber, E.  
 Berlinad Freiberg, E Ger  
 Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979 v 2 p 455-465  
 A stochastic variant of O. K. Frohlich's method is presented which gives formulas for the probability of failure of slopes. It is assumed that cohesions and angle of internal friction form random fields, whose parameters can be determined by means of usual methods of geostatistics. The model assumptions are verified by a statistical analysis of soil samples.  
 DESCRIPTORS (\*SOIL MECHANICS, \*Stability), (PROBABILITY, FAILURE).  
 IDENTIFIERS SLOPE STABILITY  
 CARD ALERT 483, 931, 922

1063372 ID NO. - EIRO063372  
**PREDICTION OF SLOPE SLIDE BY PROBABILITY OF FAILURE.**

Matsuo, M.; Ueno, M.  
 Nagoya Univ, Jpn  
 Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979 v 2 p 449-458  
 The paper proposes a prediction method for assessing slope stability under heavy rainfall. The method requires rainfall intensity as input and examines the transition process of the probability of failure P/F during and after a rainfall. It is based on an analysis of actual sliding and stable slopes that indicated important facts associated with the transition process of P/F.  
 DESCRIPTORS (\*SOIL MECHANICS, \*Stability), FAILURE ANALYSIS, PROBABILITY.  
 IDENTIFIERS SLOPE STABILITY  
 CARD ALERT 483, 931, 922

1063371 ID NO. - EIRO063371  
**MARGIN OF SAFETY FOR SLOPE STABILITY.**

Bienkowski, K.  
 Inst Geotech Politech, Wroclaw, Pol  
 Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979 v 2 p 431-436  
 The paper presents a slope stability measure based on an analysis of stresses and soil resistance. On the basis of this measure, a safety margin for stability is proposed, which uses statistical information on soil parameters. Significant aspects of the object and accuracy of computation methods which differ in formulation of stability criteria that are conditions for safety. Other possibilities of probabilistic analysis of slope stability are mentioned. Refs.  
 DESCRIPTORS (\*SOIL MECHANICS, \*Stability), PROBABILITY.

IDENTIFIERS SLOPE STABILITY, PROBABILISTIC ANALYSIS  
 CARD ALERT 483, 931, 922

1063368 ID NO. - EIRO063368  
**PROBABILISTIC APPROACH TO CONSOLIDATION ANALYSIS.**

Chang, C. S.; Soong, T. T.  
 Univ of Mass, Amherst  
 Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979 v 2 p 487-496  
 This study is concerned with an extension of the theory of one-dimensional consolidation to the study of soil behavior by taking into account randomness in the coefficient of consolidation, Cv. By assuming a probabilistic distribution of Cv, the consolidation equation is solved stochastically. For a practical range of variability in the values of Cv, the solution shows a substantial effect on the randomness of the degree of consolidation. Curves based on this solution are also developed for providing a procedure in estimating probability range of the degree of consolidation at a certain time. A numerical example is included. 2 refs.  
 DESCRIPTORS (\*SOIL MECHANICS, \*Consolidation), PROBABILITY.  
 CARD ALERT 483, 931, 922

1063367 ID NO. - EIRO063367  
**SETTLEMENT PREDICTION OF EXTENSIVE RECLAIMED LAND.**

Asaka, A.; Suzuki, M.  
 Kyoto Univ, Jpn  
 Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979 v 2 p 477-486  
 The paper presents an observational procedure of settlement prediction. First, an autoregressive equation derived is shown to give an appropriate time series model for settlement-time behavior resulting from one dimensional consolidation. The coefficients contained in this equation are related to a drain condition, time factor of consolidation and a final settlement. With the use of settlement observations these parameters are statistically identified. A future settlement is also predicted by statistical extrapolation along the autoregressive model with identified parameters. Two practical methods are presented. One is a graphical method; the other is a method based on the Bayesian approach applied in the analysis of normal autoregressive process, which can give a predictive probability distribution of future settlement. 6 refs.  
 DESCRIPTORS (\*SOIL MECHANICS, \*Consolidation), STATISTICAL METHODS, SUBSIDIENCE, GRAPHIC METHODS.  
 CARD ALERT 483, 931, 922

1063365 ID NO. - E1800863365  
**APPLICATIONS OF CLUSTER ANALYSIS TO SEISMIC MICROZONATION.**  
Crespellani, T. L., A  
Univ of Cagliari, Italy  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf  
(ICASP), Proc, Sydney, Aust, Jan 29-Feb 2 1979. Sponsored by  
Unisearch Ltd, Kensington, NSW, Aust, 1979. v 3 p 395-401  
In a given seismic area there exist several natural subsol  
conditions that contribute to influence its behavior under  
earthquake. In the investigation of soil properties for  
microzonation studies, a convenient mathematical tool is  
offered by cluster analysis. Advantages and limits in the use  
of this technique are presented and discussed. Refs.  
DESCRIPTORS: \*SOIL MECHANICS. EARTHQUAKES. STATISTICAL  
METHODS. (SOILS, ANALYSIS).  
IDENTIFIERS: CLUSTER ANALYSIS. MICROZONATION  
CARD ALERT 483, 931

1063364 ID NO. - E1800863364  
**ASSESSMENT OF THE PROBABILITY OF LIQUEFACTION OF  
WATER-SATURATED RECLAIMED LAND.**  
McGuire, R. K.; Tatsunaka, F.; Iwasaki, T.; Tokida, K.  
US Geol Surv  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf  
(ICASP), Proc, Sydney, Aust, Jan 29-Feb 2 1979. Sponsored by  
Unisearch Ltd, Kensington, NSW, Aust, 1979. v 2 p 786-801  
A method is described for assessing the probability of  
liquefaction of water-saturated, reclaimed land. The method  
accounts for the uncertain shear resistance of sand deposits  
when only standard penetration values and sand gradings are  
available. Seismically-induced shear stresses are estimated  
from surface accelerations modified to account for the  
duration of shaking, and the analysis incorporates uncertainty  
in acceleration resulting from uncertainty in the size and  
distance of the critical event. The definition of  
liquefaction uses a damage function proportional to the  
integral over depth of the ratio of shear resistance to shear  
stress. A site on Tokyo Bay is examined using the method  
Prop.  
DESCRIPTORS: \*SOIL MECHANICS. EARTHQUAKES. PROBABILITY.  
IDENTIFIERS: LIQUEFACTION  
CARD ALERT 483, 931, 922

1063363 ID NO. - E1800863363  
**JOINT DISTRIBUTION OF THE COMPONENTS OF SOIL STRENGTH.**  
Athanasou-Grivas, D. A.; Marrou William, V.  
Penssylvan Polytech Inst, Troy, NY  
Appl of Stat and Probab in Soil and Struct Eng, 3rd, Int  
Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979.  
Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979. v 1 p  
189, 197  
The paper reports on a study to examine the joint variation  
of the two components of soil strength \$EM DASH\$ cohesion and  
angle of internal friction \$EM DASH\$ and to provide a

probabilistic model for its description. The proposed model  
is the bivariate beta (Dirichlet) distribution, the analytical  
expression of which depends on the mean values, variances and  
correlation coefficient of the two strength parameters. The  
two marginal distributions that are derived from the Dirichlet  
are found to follow the beta model. Making use of the  
cumulative joint and marginal distributions, it is possible to  
determine design values for both parameters that correspond to  
specified confidence levels, which is illustrated by a case  
study.  
DESCRIPTORS: \*SOIL MECHANICS. (PROBABILITY, Mathematical  
Models), (SOILS, Testing), (MATERIALS, Mechanical  
Properties).  
CARD ALERT 483, 931, 922

1063362 ID NO. - E1800863362  
**SOME CRITERIA FOR DATA ANALYSIS.**  
Weiss, K.  
Tech Univ, Berlin, Ger  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf  
(ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979. Sponsored by  
Unisearch Ltd, Kensington, NSW, Aust, 1979. v 1 p 71-84  
Using a numerical example relating to the problem of the  
influence of the foundation shape on the ultimate bearing  
capacity of square foundations, two criteria are explained  
which are of significance for correct analysis of test data.  
Causal relationships cannot be revealed by purely statistical  
methods of approach. A theoretically clear statement on the  
functional relationship between such test data as can be  
varied arbitrarily or in dependence from other data is a basic  
prerequisite for meaningful data analysis. If the theoretical  
functional relationship between the variables observed is not  
linear, data analysis is normally linearized by suitable  
transformation and then solved by the principle of minimum  
variance. A criterion is presented dealing with the  
pre-conditions under which linearization will be admissible  
without subsequent correction.  
DESCRIPTORS: \*SOIL MECHANICS, STATISTICAL METHODS, (SOILS,  
Testing), (FOUNDATIONS, Bearing Capacity).  
IDENTIFIERS: DATA ANALYSIS  
CARD ALERT 483, 931, 922

1062827 ID NO - E1800862827  
**RELIABILITY ANALYSIS OF RETAINING STRUCTURES.**

Athanasios Grivas, D.  
Reisselae Polytech Inst., Troy, NY  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979 v 2 p 632-654  
The paper reports on a study to examine some of the uncertainties that are involved in the description of the lateral pressures against retaining walls, and to determine the probability of failure of such structures through an application of a system reliability analysis. The method of redistribution of pressure is employed to derive the expression for the pressure distribution along the wall. The safety of the retaining wall is measured through its probability of failure rather than the customary factor of safety. Four possible modes of failure are examined: overturning, base sliding, bearing capacity and overall sliding. Assuming that each mode occurs independently of the others, a single value for the probability of failure of the wall is found through a system reliability analysis. Refs.  
DESCRIPTORS (-RETAINING WALLS. •Reliability). (PROBABILITY, Failure). SOIL MECHANICS.  
CARD ALERT 405, 483, 922

1062494 ID NO - E1800862494  
**EXTREMES OF MOVING AVERAGE PROCESSES.**

Grigorii, M  
Acres Consult Serv Ltd, Niagara Falls, Ont  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979 v 1 p 95-109  
Averages of an input process depending continuously and discretely on time, called respectively moving average processes and sequences, are considered. The time step of the moving average sequence is equal to the averaging period. Results obtained for Gauss Markovian inputs show that unsafe designs may result if maxima of moving average processes are approximated by those of moving average sequences. Practical implications of this approximation are investigated in two case studies. Refs.  
DESCRIPTORS •PROBABILITY. (ENGINEERING, Applications). WIND EFFECTS. (SOIL MECHANICS, Stability).  
IDENTIFIERS MOVING AVERAGE PROCESSES  
CARD ALERT 922, 443, 487

1062057 ID NO - E1800862057  
**PILE CAPACITY SEM DASHES A RELIABILITY APPROACH.**

Madhav, M R ; Arumugam, A  
Indian Inst of Technol, Kanpur  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979 v 2 p 529-538  
To account for the variability of soils over large depths it

is desirable to use probabilistic methods to estimate the load carrying capacity of the piles. A reliability based method is proposed using Monte Carlo simulation techniques. A parametric study is carried out for piles in clays and sands and the importance of parameters like cohesion, adhesion, angle of shearing resistance, length to diameter ratio of pile, etc., is highlighted. Results are presented in the form of plots between probability of failure and normalized load.  
18 refs(in  
DESCRIPTORS (-PILES. •Bearing Capacity). SOIL MECHANICS. (PROBABILITY, Failure).  
CARD ALERT 405, 483, 922

1062056 ID NO - E1800862056  
**ESTIMATION OF THE BEARING CAPACITY OF LARGE BORED PILES IN COHESIVE SOILS USING STATISTICAL METHODS**

Rizkallah, V. J. Maschowitz, G  
Tech Univ, Hannover, Ger  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf (ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by Unisearch Ltd, Kensington, NSW, Aust, 1979 v 2 p 517-528  
The paper reports on a study to find a simple formula, based on statistical methods, to estimate the bearing capacity of large bored piles. Using data of pile load tests executed in similar cohesive soil, such as the well known results in London clay, it was possible to find a satisfactory solution, based on statistics. Data concerning the shear strength and ultimate bearing pressure versus depth were used to estimate the end bearing and the skin friction of piles. Concerning the statistical investigation the regression analysis method was used. The formula depends on three variables: end bearing, skin friction and displaced volume due to settlement. Using these variables, the maximum capacity was calculated and a correlation factor of  $r=0.82$  was obtained. The relative error which can be expected when using this formula is about 20%. 11 refs.  
DESCRIPTORS (-PILES. •Bearing Capacity). STATISTICAL METHODS. SOIL MECHANICS.  
CARD ALERT 405, 483, 922

1059933 ID NO. - E1800859933  
APPLICABILITY OF REGRESSION ANALYSIS TO INVESTIGATE THE  
INFLUENCES ON THE CARRYING CAPACITY OF GROUND ANCHORS.

Kramer, H.  
Tech Univ. Hannover, Ger  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf  
(ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by  
Unisearch Ltd, Kensington, NSW, Aust, 1979 v 2 p 437-448  
This paper describes the application of multiple regression  
analysis to the results of fundamental and suitability tests  
of ground anchors. Individual factors that influence the  
capacity of ground anchors were investigated. Two equations  
to estimate the carrying capacity are proposed, one for  
anchors in granular soil and the other for those in cohesive  
soil. The constants of both equations, including 7 influence  
factors in each case, have been determined by means of the  
linear multiple regression analysis. Using a confidence level  
of 95% the confidence bounds of the regression coefficients  
have been calculated. Refs.

DESCRIPTORS: (\*FOUNDATIONS, \*Anchorage), STATISTICAL  
METHODS, SOIL MECHANICS,  
IDENTIFIERS MULTIPLE REGRESSION ANALYSIS  
CARD ALERT 405, 483, 922

1058040 ID NO. - E1800858040  
STATISTICAL EVALUATIONS OF THE STRENGTH CHARACTERISTICS OF  
BANGKOK CLAY.

Balasubramanian, A. S.; Adikari, G. S. N.; Sivandran, C.  
Asian Inst of Technol, Bangkok, Thai  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf  
(ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by  
Unisearch Ltd, Kensington, NSW, Aust, 1979 v 1 p 198-211  
This paper presents a statistical analysis of the undrained  
shear strength of Soft Bangkok Clay. The analysis presented  
consists mainly of a study of the variation in the probability  
distribution of the undrained strength as a function of depth  
and other properties using regression models. A comparison of  
the estimated models for the various tests is made. Factor  
analysis of the laboratory test data is also presented, which  
justified the previous findings. A statistical analysis of  
the associated soil properties has also been presented for the  
many sites considered in the overall study.  
DESCRIPTORS (\*CLAY, \*Mechanical Properties), STATISTICAL  
METHODS, (SOILS, Testing), SOIL MECHANICS,  
IDENTIFIERS SOIL PROPERTY VARIABILITY, FACTOR ANALYSIS  
CARD ALERT 483, 421, 922

1058027 ID NO. - E1800858027  
PROCEEDINGS, INTERNATIONAL CONFERENCE SEM DASHS APPLICATIONS  
OF STATISTICS & PROBABILITY IN SOIL & STRUCTURAL ENGINEERING,  
3RD (ICASP 3), VOLUMES 1 THROUGH 3, 1979.

Ingles, Owen G. (Ed.)  
Univ of NSW, Dep of Civ Eng Mater, Sydney, Aust  
Appl of Stat and Probab in Soil and Struct Eng, 3rd Int Conf

(ICASP 3), Proc, Sydney, Aust, Jan 29-Feb 2 1979 Sponsored by  
Unisearch Ltd, Kensington, NSW, Aust, 1979 v 1 p 1319 p  
The three Proceedings volumes contain 87 papers presented at  
the Conference, 76 of which are indexed separately. The  
papers are grouped under general topic headings that include  
statistical techniques and data analysis, extreme value  
theory, structural load systems, soil classification and site  
investigation, properties of structural materials, pavements,  
slope stability, foundations, structural response, hydrology  
and hydraulics, safety, reliability, risk analysis and  
insurance, optimization, cost-benefit analysis, Specification  
s, earthquakes, human factors and errors.

DESCRIPTORS: \*CIVIL ENGINEERING, STATISTICAL METHODS,  
STRUCTURAL ANALYSIS, STRUCTURAL DESIGN, SOIL MECHANICS,  
HYDROLOGY,  
IDENTIFIERS: SLOPE STABILITY, PROBABILISTIC DESIGN,  
STABILITY ANALYSIS, STOCHASTIC PROCESSES, RISK ANALYSIS  
CARD ALERT: 901, 483, 408, 931, 922, 444

1040613 ID NO. - E1800540613  
PROBABILISTIC SOIL DYNAMICS: STATE-OF-THE-ART

Christian, John T.  
Storie & Webster Eng Corp, Boston, Mass  
ASCE J Geotech Eng Div v 106 n 4 Apr 1980 p 385-397  
CODEN: AJGEB6

The powerful random vibration techniques can provide  
probabilistically based descriptions of the response of soils  
and structures to earthquakes and ocean waves. Although the  
technology is well developed and uses many of the results of  
Fourier transform analyses, its general use is retarded by its  
unfamiliarity and by a substantial tradition behind the  
description of earthquakes by deterministic methods.  
Probabilistic analyses of the formal theories of liquefaction  
have identified many of the uncertainties in these theories  
and shown that they include quite significant errors.  
Statistical methods have proven useful in interpreting the  
historical records of occurrence of liquefaction. The major  
deficiency as of this writing is in the consistency of the  
historical data base rather than the analytical tools.  
Statistical methods have had some use in describing dynamic  
soil properties. 51 refs.

DESCRIPTORS: (\*SOIL MECHANICS, \*Mathematical Models),  
DYNAMICS, EARTHQUAKES, PROBABILITY, STATISTICAL METHODS,  
IDENTIFIERS SOIL DYNAMICS, SOIL LIQUEFACTION  
CARD ALERT 483, 931, 921, 484, 922

The statistical approach recognizes the random nature of soil properties and resolves their structure as identified by soil fabric parameters, which enable prediction of the means, variances and covariances of these properties at desired locations. This approach has been suggested and discussed previously by various researchers. Although the methods suggested by these authors are conceptually good, they lack practicability when data points are few, irregularly spaced and come from different sources. The analytical model presented in this paper overcomes these shortcomings: in addition, it permits the analysis of biased data and uses matrix formulation throughout, thus making it adaptable to computer applications. 5 refs.

DESCRIPTORS (\*SOILS, \*Mechanical Properties), STATISTICAL METHODS, (MATERIALS, Physical Properties), SOIL MECHANICS, (CARD ALERT 483, 421, 922)

1075015 ID NO - E1800325015  
**RELIABILITY OF EARTH SLOPES.**  
 Tobutt, D. C., Richards, E. A.  
 HEBC, London, Engl

323-354 CODEN IJRMGZ Geomech v 3 n 4 Oct-Dec 1979 p  
 Methods recommended for calculating the probability of failure of earth slopes, as distinct from factor of safety, are discussed. In particular the 'level III' and 'level II' approaches as defined by the Joint Committee of Structural Safety are referred to; these are set forth in 'Rationalisation of safety and serviceability factors in structural codes'. Technical Report 63 of the Construction Industry Research and Information Association, and attention is drawn to the contributions therein by M. J. Baker and M. Horne, and to how these considerations affect this particular problem. The mechanical model used throughout is Bishop's simplified method. 17 refs.

DESCRIPTORS (\*SOIL MECHANICS, \*Stability), (EMBANKMENTS, Reliability), EARTH SLOPES, SLOPE STABILITY  
 (CARD ALERT 483, 931)

1075033 ID NO - E180025033  
**STATISTICAL ANALYSIS OF GEOTECHNICAL RECORDS.**  
 Tabba, M. M., Assad, Yung, Raymond N.  
 Nat'l Boring & Sounding Inc., Montreal, Que.  
 Proc ASCE Eng Mech Div Spec Conf, 3rd, Univ of Tex, Austin, Tex, 1979 p 331-334

The growing use of optimization in pit mine design has increased interest in the way predictions of slope stability are made. Slope angles and heights have traditionally been analyzed deterministically and treated as constraints in pit design, but models are now available for predicting probabilities of failure and probability distributions over failure volume. These new approaches and the models of rock mass behavior they are based on are reviewed. A discussion as to how the present cannot pretend to exhaustiveness, thus the intent is to examine underlying assumptions and leave details to referenced sources. 32 refs.

DESCRIPTORS \*ROCK MECHANICS, MINES AND MINING, (CARD ALERT 502, 483, 504, 505)

1075034 ID NO - E1800478704  
**MECHANISM OF DEFORMATION OF PARTICULATE MATERIALS AS MARKOV PROCESS.**  
 Kitamura, Ryosuke.  
 Kagoshima Univ, Jpn.  
 Zairyo, v 28 n 311 Aug 1979 p 718-724 CODEN ZARYAO  
 ISSN 0514-5163

The micrometric approach which can establish the constitutive relations of particulate materials such as sand is described. In this approach the motion of particles in particulate materials is assumed to be a Markov process. First, the Markov process is explained briefly and the basic equation of the Markov process is derived. Secondly, the Markov process is applied to the mechanical behavior of particulate materials, and the concepts of potential barrier and potential slip plane are introduced to determine the coefficients in the basic equation of the Markov process. Thirdly, the strain of particulate materials is derived by averaging the motion of particles. Finally, the stress-strain relationship obtained from the micrometric approach is compared with the result of the drained triaxial compression test on Toyoura Sand. In Japanese.

DESCRIPTORS \*MATERIALS SCIENCE, STATISTICAL METHODS, SOIL MECHANICS, SAND AND GRAVEL, Mechanical Properties), IDENTIFIERS PARTICULATE MATERIALS  
 (CARD ALERT 421, 931, 922, 481)

1075015 ID NO - E1800325015  
**RELIABILITY OF EARTH SLOPES.**  
 Tobutt, D. C., Richards, E. A.  
 HEBC, London, Engl

323-354 CODEN IJRMGZ Geomech v 3 n 4 Oct-Dec 1979 p  
 Methods recommended for calculating the probability of failure of earth slopes, as distinct from factor of safety, are discussed. In particular the 'level III' and 'level II' approaches as defined by the Joint Committee of Structural Safety are referred to; these are set forth in 'Rationalisation of safety and serviceability factors in structural codes'. Technical Report 63 of the Construction Industry Research and Information Association, and attention is drawn to the contributions therein by M. J. Baker and M. Horne, and to how these considerations affect this particular problem. The mechanical model used throughout is Bishop's simplified method. 17 refs.

DESCRIPTORS (\*SOIL MECHANICS, \*Stability), (EMBANKMENTS, Reliability), EARTH SLOPES, SLOPE STABILITY  
 (CARD ALERT 483, 931)

1025012 ID NO. - E1800725012  
RELATIVE ACCURACY AND MODIFICATION OF SOME DYNAMIC PILE  
CAPACITY PREDICTION EQUATIONS.

Ramey, George E.; Johnson, Roy C., Jr.  
Auburn Univ., Ala  
Ground Eng v 12 n 6 Sep 1979 p 47-50 CODEN: GROEAV  
ISSN 0017-4653  
Measured capacities of various pile types driven into cohesionless and cohesive soils were compared with capacities predicted by the Engineering News, Modified Engineering News, Hiley, Danish and Gates equations. Linear regression analyses were performed to evaluate slope and intercept modification values for each equation. The analyses indicated that the FN equation probably provided the best overall correlation between predicted and measured pile failure load. Other investigators cited in the article found the equation to rate highly or poorly relative to other prediction equations. These considerable differences in relative performances of various impact equations with differing data sets indicate the strong data set dependency in making judgments on the equations' relative accuracies or correlations.  
DESCRIPTORS: \*SOIL MECHANICS. PILES. STATISTICAL METHODS.  
IDENTIFIERS: DYNAMIC PILE CAPACITY  
CARD ALERT 483, 931, 922

1016688 ID NO. - E1800216688  
PROBABILISTIC SITE-DEPENDENT RESPONSE SPECTRA

Kiremidjian, Anne S.; Shah, Hareesh C.  
Stanford Univ., Calif  
ASCE J Struct Div v 106 n 1 Jan 1980 p 69-86 CODEN: JSDEAG  
A method is developed for obtaining probabilistic soil-dependent pseudo-absolute acceleration response spectra. The resulting spectra are consistent with the acceptable design risk level from future earthquakes at a specific site. Structural exposure to future earthquakes is obtained in terms of probabilities of peak ground acceleration values that can occur at firm grounds, intermediate soils, and soft soil sites. These are combined with gamma-distributed response spectral shapes (or dynamic amplification factors) and for firm grounds, intermediate soils, and soft soils. Strong earthquake ground-motion data from past seismic events are used as basis for the development of the response spectral shapes. The convolution of the probability distribution of peak ground acceleration with the corresponding probability distributions on response spectral shapes yield the probability distribution of pseudo-absolute acceleration response spectra as functions of structural period and damping. From them, response spectra for 10%, 20%, and 50% risk levels are developed at sites with firm, intermediate, and soft ground conditions. 14 refs.  
DESCRIPTORS: (\*STRUCTURAL DESIGN, \*Earthquake Resistance), MATHEMATICAL MODELS, PROBABILITY, SOIL MECHANICS, DYNAMICS, IDENTIFIERS, DYNAMIC RESPONSE  
CARD ALERT 408, 484, 921, 922, 483, 931

1016684 ID NO. - E1800216684  
PROCEEDINGS OF THE SOUTH PACIFIC REGIONAL CONFERENCE ON  
EARTHQUAKE ENGINEERING, 2ND, VOLUMES 1 THROUGH 3, 1979.

Avon  
NZ Natl Soc for Earthquake Eng, Wellington  
Proc of the South Pac Reg Conf on Earthquake Eng, 2nd, Victoria Univ, Wellington, NZ, May 8-10 1979 Sponsored by NZ Natl Soc for Earthquake Eng, Wellington 3 vol 763 p  
The three volumes contain 43 papers presented at the Conference, 24 of which are indexed separately. Among the subjects covered are a new proposal for estimating maximum earthquake forces at nuclear power plants, seismic design of highway bridges with soil-structure interaction, seismic risk and design criteria, assessing earthquake-induced soil liquefaction potential, dynamic earth pressure determination, structural performance of houses in earthquakes, seismic design of timber structures, earthquake forecasting probability charts, cyclic load testing of reinforced concrete beam-column joints, design of ductile reinforced concrete frames, hysteretic dampers for earthquake protection of structures, and others.  
DESCRIPTORS: (\*STRUCTURAL DESIGN, \*Earthquake Resistance), (\*STRUCTURAL ANALYSIS, Dynamic Response), (\*FOUNDATIONS, BUILDINGS, SOIL-Structure Interaction), BUILDINGS, (CONCRETE CONSTRUCTION, Reinforced Concrete), SOIL MECHANICS, IDENTIFIERS: SEISMIC RISK ANALYSIS, STRUCTURAL FRAMES, LIQUEFACTION, GROUND MOTION  
CARD ALERT: 408, 484, 931, 483, 402

1016246 ID NO. - E1800216246  
METAL VERSUS NONWOVEN FIBER FABRIC EARTH REINFORCEMENT IN  
DRY SANDS: A COMPARATIVE STATISTICAL ANALYSIS OF MODEL TESTS.

Tumay, M. T.; Antonini, Mario; Arman, Ala  
La State Univ, Baton Rouge  
Geotech Test J v 2 n 1 Mar 1979 p 44-56 CODEN: GTJODJ  
An experimental model study to compare the efficiency of metal and nonwoven fiber fabric reinforcement in mobilizing soil is presented. The results of the study are summarized in a table and double quotes sand-tie interaction strength double quotes was developed. Model retaining walls were constructed in a sample box, sand was gradually deposited at predetermined relative densities by a specially designed stationary depositor, and reinforcements were placed during deposition at varying levels and concentrations to meet the requirements of a statistical experimental setup. It was concluded that fiber fabric has advantages over the metal reinforcement used in the construction of reinforced earth structures. 25 refs.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Stabilization), IDENTIFIERS: EARTH REINFORCEMENT  
CARD ALERT: 483, 931

1016243 ID NO EIR0216243  
NONSTATIONARY RISK MODEL WITH GEOPHYSICAL INPUT  
Savy, Jean B., Shah, Hareesh C.; Boore, David  
MIT, Cambridge, Mass  
ASCE J Struct Div v 106 n 1 Jan 1980 p 145-163 CODEN  
JSDR45

A geophysical model of ground-motion simulation is used to generate the statistics of the power spectral density (PSD) of the acceleration at the bedrock level of a site. A nonstationary Poisson model of occurrences is then developed to combine the effects of all the probable sources in the seismic zone of interest. The consistent probability PSD is computed as a basic design parameter. Consistent probability peak response spectra, rms response spectra, and pseudotime histories are also derived as design parameters. A numerical example is given for a site in southern California to demonstrate the applicability of the method. 21 refs.  
DESCRIPTORS: (\*SOIL MECHANICS), \*Mathematical Models, EARTHQUAKE RESISTANCE, GEOPHYSICS, Seismic, SEISMOLOGY, IDENTIFIERS, EARTHQUAKE ENGINEERING, GROUND MOTION  
CARD ALERT: 481, 931, 484, 481

1016245 ID NO EIR0216245  
NON CYLINDRICAL FLEXURAL SLIP FOLDING IN THE ARDWELL FLAGS  
SEM DASH A STATISTICAL APPROACH  
Williams, Graham D.; Spratt, John W.  
Geol Coll, Cardiff, Wales  
Tectonophysics v 58 n 3 4 Oct 1 1979 p 269-277 CODEN  
TETDAM

Flexural slip folding is described from the non-cylindrical, flexural slip folding in the well-known coastal section between Ardwell Bay and Kennedy's Pass, near Girvan, southwest Scotland. Bedding plane slip is recognized by the ubiquitous slickenside striations on bedding surfaces. Statistical treatment of the orientation of structural and kinematic elements yields important conclusions concerning fold formation. The Ardwell folds are markedly non-cylindrical and this is a primary feature amplified during the Ardwell Fold Phase. 19 refs.  
DESCRIPTORS: (\*GEOLOGY, \*Tectonics), ROCK MECHANICS,  
CARD ALERT 481, 483

999199 ID NO E1791299199  
PROBABILISTIC PROCEDURES FOR PEAK GROUND MOTIONS  
Blume, John A.; Kiremidjian, Anne S.  
URS/John A. Blume & Assoc., San Francisco, Calif  
ASCE J Struct Div v 105 n 11 Nov 1979 p 2293-2311 CODEN  
JSDR45

Three methods of estimating the frequency of earthquake occurrence are presented. regression analysis of past earthquake data, integration of fault displacement data over long time periods, and consideration of plate boundary displacement rates. The models consider fault rupture as a function of magnitude when faults can be modeled as line

sources. When locations and activity rates are not known, seismically active regions are modeled as diffused area sources. The equation for attenuation of ground motion includes a soil impedance factor and a lognormal probability distribution on the data scatter. By applying the three procedures to a site for a nuclear power plant in southern California, it was determined that the plate boundary method yields lower peak ground motion values than the other methods at the same risk level. The highest peak ground acceleration values were predicted by the long-period (20,000,000 yr) fault-dislocation method. 24 refs.

DESCRIPTORS: (\*STRUCTURAL DESIGN, \*Earthquake Resistance), (\*STRUCTURAL ANALYSIS, \*Mathematical Models), PROBABILITY, EARTHQUAKES, SOIL MECHANICS, IDENTIFIERS, GROUND MOTIONS, SEISMIC SURVEYS  
CARD ALERT: 408, 484, 931, 922, 483

990262 ID NO E1791190262  
ICE BEHAVIOUR UNDER LOAD  
Zaretzky, Yu. K.; Chumichev, B. D.; Solomatn, V. I.  
Hydroproj Inst, Moscow, USSR  
Eng Geol v 13 n 1-4 Apr 1979, Int Symp on Ground Freezing, 1st, Bochum, Ger Mar 8-10 1978 p 299-309 CODEN EGGDAD  
ISSN 0013-7952

Results of experimental investigations into the regularities of ice strain and failure under the conditions of short-time creep are given in this paper. The experiments were to test ice for creep under a uniaxial compressive stress, using the emission acoustic method of recording the microcrack formation. It is shown experimentally that the ultimate strength of ice signifying a maximum stress after which ice deforms plastically, without passing into the stage of accelerated flow, is consistent with the stress under which the process of microcrack formation begins. It was found that this limit is independent of temperature. As a result of the study, an analytical relationship was determined between defect number, stress and time, and an equation of ice strain has been deduced on the basis of statistical methods. This equation estimates temporal creep strain development, depending on stress, structural characteristics of ice and its temperature. 10 refs.  
DESCRIPTORS: (\*SOILS, \*Frozen), (GEOLOGY, Engineering), SOIL MECHANICS,  
CARD ALERT 483, 481, 901, 931

980220 ID NO. - E179140920  
**SEISMIC MOTION AND RESPONSE PREDICTION ALTERNATIVES.**  
 Cornell, C. Allin, Banoh, Hooshang; Shakai, Anthony F.  
 MIT, Cambridge, Mass.  
 Earthquake Eng. Struct. Dyn. v 7 n 4 Jul-Aug 1979 p 295-315  
 CODEN EJEF8G  
 ISSN 0375 6297

Statistical methods are available which predict the maximum response of simple oscillators given the peak acceleration (A/p), peak velocity (V/p) or peak displacement (D/p) of seismic ground motions. An alternative parameter, namely an ordinate (ground ordinates) of the Fourier amplitude spectrum of ground motion acceleration,  $fS(f)$ , may in fact be a preferred predictor of peak response, especially in a frequency range close to  $f$ . Other statistical methods (attenuation laws) use distance  $R$  and other parameters such as magnitude ( $M$ ). Modified Mercalli epicentral intensity ( $I/0$ ) and Modified Mercalli site intensity ( $I/M$  or  $I/S$ ) to predict spectral velocity ( $S/V(f)$ ), etc. In using such approaches, it is most desirable to know the total uncertainty in the predicted peak response of the system given the starting parameter values. An extensive strong motion data set is used to study these questions. The most direct prediction models are found in the preferable (have lower prediction dispersion) but data may not be available in all regions to permit their use. 18 refs.  
 DESCRIPTORS: \*SOIL MECHANICS. \*SEISMIC WAVES. \*DYNAMICS. \*STATISTICAL METHODS.  
 IDENTIFIERS: GROUND MOTION. PEAK RESPONSE  
 CARD ALERT 483, 931, 484

989695 ID NO. - E1791199695  
**RAILROAD BALLAST LOAD RANKING CLASSIFICATION**  
 Raymond, Gerald P.; Dyaljoe, Vishnu A.  
 Queen's Univ, Kingston, Ont.  
 ASCE J. Geotech. Eng. Div. v 105 n 10 Oct 1979 p 1133-1153  
 CODEN AJGEB6  
 An investigation into the permanent deformation and degradation ranking (i.e., load ranking) of railroad ballast subject to laboratory repeated loading at a stress level comparable with those below North American heavy freight axle loads is reported. Some field data are also presented. Plastic deformations, change in grading, and production of fines are statistically linearly correlated with the aggregate physical characteristics. In general, the most significant physical characteristic is the aggregate hardness as measured by an autogenous grinding process termed Mill Abrasion. As the stress level increases above that related to railroad freight aggregate toughness as measured by the Los Angeles Abrasion becomes more significant. 19 refs.  
 DESCRIPTORS: (\*RAILROAD PLANT AND STRUCTURES. \*Embankments). \*RAILROADS. \*SOIL MECHANICS.  
 IDENTIFIERS: RAILROAD BALLAST, MINERAL ANALYSIS  
 CARD ALERT: 681, 433, 483, 931

982499 ID NO. - E1791082499  
**PROBABILISTIC MODEL OF BEARING CAPACITY FOR NON-COHESSIVE SOILS.**  
 Vyas, S. K.; Dhillon, G. S.  
 Punjab Agric. Univ, Ludhiana, India  
 Irrig. Power v 36 n 1 Jan 1979 p 91-99 CODEN IRPWAA  
 ISSN 0367-9093  
 Data for standard penetration, laboratory test and plate load tests, carried out in connection with field investigations, were collected. Penetration test was carried out to a maximum depth of 6.1 m. 10 refs.  
 DESCRIPTORS: \*SOIL MECHANICS. \*MATHEMATICAL MODELS. PROBABILITY. (FOUNDATIONS, Bearing Capacity).  
 IDENTIFIERS: NON-COHESSIVE SOILS  
 CARD ALERT 483, 931, 921, 922, 405

981152 ID NO. - E1791081152  
**CASE HISTORIES-PILE DRIVING IN THE GULF OF MEXICO.**  
 Stockard, D. M.  
 Petro-Mar Eng. Inc.  
 Offshore Technol Conf. 11th Annu. Proc., Houston, Tex., Apr. 30-May 3 1979. Publ. by Offshore Technol Conf., 6200 N. Central Expressway, Dallas, Tex., 1979 v 2 p 737-746 CODEN: OSTEBA

This paper presents a series of case histories on pile driving in the Gulf of Mexico, demonstrating the value of a pile drivability analysis to the engineer planning an offshore pile driving operation. In this study, actual pile-driving records are compared with the results of pile drivability analyses. Piles in the study varied from 30 to 60 inches in diameter with penetrations to 340 feet. Steam hammers with energy ratings of from 60,000 to 300,000 foot pounds were used. Soils varied from under-consolidated clays with very driving to dense sands through which driving was very difficult. Also included in the studies is a simplified approach to pile drivability studies in which typical properties for soils, hammers, and cushions are used. In addition, various techniques are used to improve the probability of trouble-free pile driving.  
 DESCRIPTORS: (\*PILES. \*Driving). (OCEAN ENGINEERING, FOUNDATIONS). OFFSHORE STRUCTURES. SOILS. SOIL MECHANICS.  
 CARD ALERT 405, 472, 483, 674

978775 ID NO - E1791078735  
**RELATION BETWEEN THE UNIAXIAL TENSILE STRENGTH AND THE SAMPLE SIZE FOR BOHUS GRANITE**  
Wijk, G.; Reinhardt, G.; Logdiström, G.  
Atlas Copco, Cent. Phys. Lab., Stockholm, Swed  
Rock Mech Felsmech Mec Roches v 10 n 4 Apr 1978 p 201-219  
CODEN RMFMAS

An experimental investigation has shown that the uniaxial tensile strength of Bohus granite is independent of the sample size within a very large range of volume. An indirect measurement of the tensile strength such as the point load test does, however, yield the well-known decrease in strength with increasing sample volume. The reasons for these results are discussed and a theoretical extension of Weibull's statistical theory for the tensile strength of materials is used to indicate that the uniaxial tensile strength test may be a measurement of the minimum tensile strength of the bonding between the grains in the rock. 11 refs  
DESCRIPTORS (\*GRANITE, \*Testing), ROCK MECHANICS.  
CARD ALERT 414, 482, 483

978624 ID NO - E1791078624  
**TECTONIC SIGNIFICANCE OF JOINTS IN THE CANARY ISLANDS.**  
Scheidegger, A. E.  
Tech Univ, Wien, Austria  
Rock Mech Felsmech Mec Roches v 11 n 2 Sep 1978 p 69-85  
CODEN RMFMAS

The orientations of joints were measured on four islands of the Canary Archipelago: Lanzarote, Gran Canaria, Tenerife and La Gomera. Although the rocks on these islands are mostly of volcanic origin, evidence is adduced that many joints can be considered as of tectonic origin and that those not of tectonic origin, viz those caused by shrinking of lava during cooling, can be expected to cancel out in a statistical evaluation procedure due to their random orientations. Accordingly, the data were processed by a statistical method of Kuhlback and Schneiderger and preferential joint strikes were determined for the islands mentioned. 5 refs.  
DESCRIPTORS (\*GEOLOGY, \*Tectonics), ROCK MECHANICS, STATISTICAL METHODS.  
CARD ALERT 481, 483, 922

976513 ID NO - E1791076513  
**STATISTICAL INTERPRETATION OF SHOCK SERIES IN MINING.**  
Matczak, H.  
Rock Mech Felsmech Mec Roches v 10 n 4 Apr 1978 p 181-186  
CODEN RMFMAS

In many coal mines in Poland the mining shocks are being registered and interpreted to determine the danger caused by bumps. So far, no generally accepted theory has been developed which would help define the hazards involved on the basis of seismological measurements. The author analyzes the possibility of using such measurements, taking into account various mining and geological conditions. Size of studied

976437 ID NO - E1791076437  
**VARIABILITY AND ANISOTROPY OF MECHANICAL PROPERTIES OF THE PITTSBURGH COAL SEAM.**  
Cook, Nevis E., Jr.; Ko, H. Y.; Gerstle, K. H.  
Univ of Colo, Boulder  
Rock Mech Felsmech Mec Roches v 11 n 1 Jun 1978 p 3-18  
CODEN RMFMAS

Results of an experimental program to determine the vertical variation of material stiffness and strength of an important coal seam are presented, with the aim of providing information for realistic modeling for purposes of analysis. The seam is divided into four zones, and data from each are evaluated statistically. It is concluded that this seam contains two zones with measurably different properties, which, however, are small compared to the observed scatter of data. 6 refs  
DESCRIPTORS (\*COAL DEPOSITS, \*Pennsylvania), ROCK MECHANICS  
CARD ALERT 503, 483

976437 ID NO - E1791076437  
**VARIABILITY AND ANISOTROPY OF MECHANICAL PROPERTIES OF THE PITTSBURGH COAL SEAM.**  
Cook, Nevis E., Jr.; Ko, H. Y.; Gerstle, K. H.  
Univ of Colo, Boulder  
Rock Mech Felsmech Mec Roches v 11 n 1 Jun 1978 p 3-18  
CODEN RMFMAS

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DESCRIPTORS (\*COAL DEPOSITS, \*Pennsylvania), ROCK MECHANICS  
CARD ALERT 503, 483

976437 ID NO - E1791076437  
**VARIABILITY AND ANISOTROPY OF MECHANICAL PROPERTIES OF THE PITTSBURGH COAL SEAM.**  
Cook, Nevis E., Jr.; Ko, H. Y.; Gerstle, K. H.  
Univ of Colo, Boulder  
Rock Mech Felsmech Mec Roches v 11 n 1 Jun 1978 p 3-18  
CODEN RMFMAS

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DESCRIPTORS (\*COAL DEPOSITS, \*Pennsylvania), ROCK MECHANICS  
CARD ALERT 503, 483

973871 ID NO - E1790973871  
**DYNAMIC PROPERTIES OF FINE GRAINED SOILS.**

Fritz, F. V. Jr.; Lytton, R. L.  
Tex A&M Univ. College Station.  
Proc of the Int Conf on Soil Mech and Found Eng. 9th, Tokyo, Jpn. Jul 11-15 1977 Publ by Jpn Soc of Soil Mech and Found Eng. Tokyo, 1977 and 1978 v 2 p 217-224  
Three fine grained soils, varying in clay content between 20% and 70%, were tested in a unique repetitive loading apparatus to determine how soil suction, temperature, and stress state affect the resilient modulus and residual strains expected under highway and railroad loadings. In developing equations to predict these dynamic properties, three values of soil suction, stress intensity, and temperature were used in tests of each of the three soils in a statistically designed experiment. A fundamental change in the behavior of the tested soils from left double quotes effectively saturated right double quotes to left double quotes effectively unsaturated right double quotes occurs at a soil suction corresponding to two percent dry of the optimum moisture content. The critical soil suction is directly related to the clay content of the soils. 6 refs.  
DESCRIPTORS: (\*SOILS. \*Testing). (ROADS AND STREETS. Stabilization). SOIL MECHANICS. MATHEMATICAL MODELS.  
IDENTIFIERS: FINE GRAINED SOILS. SOIL SUCTION  
CARD ALERT: 483. 421. 406. 931. 922

973794 ID NO - E1790973794  
**STIMULATION OF THREE-DIMENSIONAL STRONG GROUND MOTIONS ALONG PRINCIPAL AXES, SAN FERNANDO EARTHQUAKE.**

Kubo, Tetsuo; Penzien, Joseph  
Univ of Tokyo, Jpn  
Earthquake Eng Struct Dyn v 7 n 3 May-Jun 1979 p 279-294  
CODEN: IJEEBG  
ISSN 0375-6297  
Power spectral density which describes frequency content is considered one of the most significant properties to be taken into account when generating ground motions through the use of stochastic processes. Using a smoothed and normalized Fourier amplitude spectrum, frequency content for components of motion along a set of principal axes is estimated. Fourier amplitude spectra obtained by this moving-window technique are presented which show the time dependency of frequency content for motions produced by the San Fernando earthquake of February 9, 1971. A mathematical model to simulate ground motion processes is proposed for which both the intensity and frequency content are non-stationary. 11 refs.  
DESCRIPTORS: \*SOIL MECHANICS. (SEISMIC WAVES. Spectrum Analysis). (EARTHQUAKES. San Fernando, California). STATISTICAL METHODS. MATHEMATICAL MODELS.  
IDENTIFIERS: GROUND MOTION. STOCHASTIC PROCESSES  
CARD ALERT: 483. 931. 484. 922

973803 ID NO - E1790973803  
**PROBABILISTIC ANALYSIS OF EXCAVATED EARTH SLOPES.**

Kraft, L. M. Jr.; Mukhopadhyay, J.  
McClelland Eng. Inc. Houston, Tex  
Proc of the Int Conf on Soil Mech and Found Eng. 9th, Tokyo, Jpn. Jul 11-15 1977 Publ by Jpn Soc of Soil Mech and Found Eng. Tokyo, 1977 and 1978 v 2 p 109-116  
The performance behavior of excavated earth slopes is statistically heterogeneous cohesive soils has been studied analytically by using the deformation on the slope boundary as a measure of the performance. The soil stress-strain response is modeled as nonlinear and inelastic using a hyperbolic expression. For comparison, elastic cases were studied also. The statistical heterogeneity of the soil strength is generated by Monte Carlo Simulation technique using log-normal probability distribution function, and the finite element method is used to calculate deformations and stresses. The results of the analysis are readily amenable to nondimensional graphic representation. The results are summarized in several graphs showing the quantitative influence of soil heterogeneity, number of tested soil samples, and the definition of failure on the selection of the safety factor for a requisite reliability. 30 refs.  
DESCRIPTORS: (\*SOIL MECHANICS. \*Mathematical Models). EXCAVATION. (MATHEMATICAL TECHNIQUES. Finite Element Method). STATISTICAL METHODS. PROBABILITY.  
IDENTIFIERS: PROBABILISTIC ANALYSIS. SLOPE STABILITY  
CARD ALERT 483. 931. 921. 405. 922

973793 ID NO. E1790973793  
ANALYSIS OF THREE-DIMENSIONAL STRONG GROUND MOTIONS ALONG  
PRINCIPAL AXES, SAN FERNANDO EARTHQUAKE

Kubo, Tetsuo; Penzien, Joseph  
Univ. of Tokyo, Jpn.  
Earthquake Eng. Struct. Dyn. v 7 n 3 May Jun 1979 p 265-278  
CODEN JEERG

ISSN 0375-6297  
An orthogonal set of principal axes is defined for earthquake ground motions. These principal axes are obtained such that the corresponding variances of motion have maximum, minimum and intermediate values and the covariances equal zero. This indicates that the corresponding components of motion along the principal axes are uncorrelated with respect to each other. Since real earthquake accelerograms are assumed to be reasonably well represented by Gaussian random processes, the three components of motion along the principal axes are statistically independent of each other. Using these principal axes and applying the moving window technique to the ground accelerograms recorded during the San Fernando earthquake of February 9, 1971, time-dependent characteristics of three-dimensional ground motions along principal axes are determined. 18 refs.

DESCRIPTORS \*SOIL MECHANICS; (EARTHQUAKES, San Fernando, California); (SEISMIC WAVES, Spectrum Analysis).  
IDENTIFIERS GROUND MOTION  
CARD ALERT 483, 931, 484

973792 ID NO. E1790973792  
ESTIMATION OF GROUND MOTION PARAMETERS.

Bourc, David M.; Dobson, William B.; Oliver, Adolph A. III,  
Page, Robert A.  
US Geol Surv Circ n 795 1978 46 p CODEN XICIA5  
ISSN 0083-1107

Strong motion data from western North America for earthquakes of magnitude greater than 5 are examined to provide the basis for estimating peak acceleration, velocity, displacement, and duration as a function of distance for three magnitude classes. A subset of the data (from the San Fernando earthquake) is used to assess the effects of structural size and of geologic site conditions on peak motions recorded at the base of structures. Small but statistically significant differences are observed in peak values of horizontal acceleration, velocity and displacement recorded on soil at the base of small structures compared with values recorded at the base of large structures. Some consideration is given to the prediction of ground motions at close distances where there are insufficient recorded data points. As might be expected from the lack of data, published relations for predicting peak horizontal accelerations give widely divergent estimates at close distances. Refs.  
DESCRIPTORS \*SOIL MECHANICS; SEISMIC WAVES; EARTHQUAKES; GEOLOGY.

IDENTIFIERS GROUND MOTION  
CARD ALERT 483, 931, 484, 481

969092 ID NO. E1790969092  
DESIGN EARTHQUAKE MOTIONS BASED ON GEOLOGIC EVIDENCE.

Bell, James M.; Hoffman, Roy A.  
Creswell Davis-Dixon Assoc., Pasadena, Calif.  
Proc. of the ASCE Geotech. Eng. Div. Spec. Conf. Earthquake Eng. and Soil Dyn., Pasadena, Calif., Jun 19-21 1978 (Publ. by ASCE, New York, N.Y., 1978, v 1 p 231-271)

The determination of design earthquakes, ground motions and response spectra based on seismic risk analyses including geologic evidence is discussed in general and illustrated with results for an example site in the Los Angeles Harbor area. The site was underlain by approximately 300 feet of very dense sand and located about one mile from the Palos Verdes fault and about 7 miles from the Newport-Inglewood fault. The probability analyses included three seismic risk models with earthquake data records based on instrumental magnitudes, felt intensities, and geologic evidence. Emphasis is placed on the importance of historic earthquake data records based on geologic evidence; the fault risk model gave about 50% higher ground accelerations than the regional or area seismicity based on instrumental records. 47 refs.

DESCRIPTORS (-EARTHQUAKES, \*Design); GEOLOGY; SOIL MECHANICS; (STRUCTURAL DESIGN, Earthquake Resistance).  
IDENTIFIERS SEISMIC RISK ANALYSIS  
CARD ALERT 484, 481, 483, 408

968696 ID NO. - E179086696  
**STOCHASTIC SEISMIC STABILITY PREDICTION OF EARTH DAMS.**  
Singh, Mahendra P.; Khataa, Tara P.  
Va Polytech Inst & State Univ, Blacksburg  
Proc of the ASCE Geotech Eng Div Spec Conf: Earthquake Eng  
and Soil Dyn, Pasadena, Calif, Jun 19-21 1978 Publ by ASCE,  
New York, NY, 1978 v 2 p 875-889

A method, based on stochastic principles, is presented for seismic stability prediction of earth dams. The problem of nonlinearity due to strain dependent soil properties is solved through the stochastic linearization technique; the formulation for applying this technique to a finite element discretization of a dam is developed. The method is iterative and step-wise linear. Stochastic description of seismic input in terms of spectral density function can be conveniently used in this method. The method can also be used directly with the ground response spectra curves usually prescribed in seismic designs. Zero crossing and peak statistics of the stress response are used to define the statistics of the stress damage. The application of the method is demonstrated with an example of an earth dam. 12 refs.

DESCRIPTORS: (\*DAMS, EMBANKMENT, \*Stability), STATISTICAL METHODS, SOIL MECHANICS, (SOILS, Mechanical Properties), EARTHQUAKE RESISTANCES.

IDENTIFIERS: SEISMIC STABILITY, STABILITY ANALYSIS  
CARD ALERT: 441, 483, 931, 922

965855 ID NO. - E1790865855  
**UNCERTAINTY FINITE ELEMENT DYNAMIC ANALYSIS.**  
Dendrou, B. A.; Houston, E. N.  
Purdue Univ, West Lafayette, Indiana  
Appl Math Modelling v 3 n 2 Apr 1979 p 143-150 CODEN  
AMM0DL

ISSN 0307-904X  
The prevention of damage to large earth structures due to dynamic effects necessitates an analytical model capable of predicting the response of the structure. A realistic model ought to consider the variability of the physical parameters describing the media. In this paper, authors present an uncertainty finite element model analysis based on a perturbation technique, considering the spatial distribution of the first and second statistical moments of the modulus of elasticity, Poisson's ratio and density, to be known. The proposed semistochastic analytical model is based on an inference correlative scheme which links the data sampling activities and a finite element dynamic model. Finally the sensitivity of the dynamic process to error in the input information is examined. 10 refs.

DESCRIPTORS: (\*STRUCTURAL ANALYSIS, \*Dynamic Response), (SOIL MECHANICS, Mathematical Models), (MATHEMATICAL TECHNIQUES - Finite Element Method), (STATISTICAL METHODS, Applications),  
CARD ALERT: 931, 483, 922

SICHERHEITSNACHWEISE FUER EIN DAMMPROJEKT AUF  
PROBABILISTISCHER GRUNDLAGE. (left brackets) Safety Analysis  
of an Earth Dam on Probabilistic Basis (right brackets)  
Schnefler, Eckert

Calculations for an earth dam are presented by application of the new concept. Since in soil mechanics statistical data cannot uniformly be assumed because of the heterogeneity of soils, the failure probability for the dam has been calculated with variances of the soil parameters. A comparison is made between the conventional and the new probabilistic safety concept. 9 refs. In German with English abstract.

DESCRIPTORS: (\*DAMS, EMBANKMENT, \*Structural Analysis), (STRUCTURAL DESIGN, Safety Factor), MATHEMATICAL MODELS,  
PROBABILITY, SOIL MECHANICS,  
CARD ALERT: 441, 931, 408, 921, 922, 483

938864 ID NO. - E1790538864  
**CITY PLANNING AND THE URBAN UNDERGROUND.**  
Jansson, Birger  
Vattenbyggnadsbyran, Gothenberg, Sweden  
Underground Space v 3 n 3 Nov-Dec 1978 p 99-115 CODEN  
UNSP09

Demand for subsurface space must be based on specific statistics and investigatory studies. Cost-benefit analysis, as well as liability and indemnity, are general considerations for all kinds of land use planning. The law and administrative rules should be recognized in a way which avoids unnecessary restriction of underground use, but which gives reasonable regulations for safe and rational use. The following five fields require specific knowledge of subsurface construction and subsurface use: internal environment, registration of subsurface establishments, hydrogeology, geology and soil mechanics, and tunneling technology. The conclusion of the Swedish report is that subsurface planning should be seen as integrated planning within society's planning as a whole, that is, in close connection with surface planning.

DESCRIPTORS: \*URBAN PLANNING, TUNNELS AND TUNNELING,  
IDENTIFIERS: UNDERGROUND SPACE  
CARD ALERT: 403, 401

938799 ID NO. E1790538799  
**RELIABILITY OF ESTIMATING ROCK EXCAVATION COST IN TUNNELING SPECIFICATIONS.**

Kurzmann, Ernst  
Rock Mech Felsmehc Mec Riches Supply 7, 1978 Geol Reconnaissance Tunneling - Min - Rock Support - Power Plant Constr. Contrib to the Geomech Colloq, 26th, Austrian Soc for Geomech, Salzburg, Oct 13-14 1977. Publ 1978 p 53-65 C00FN RMPMAS

Tunnel construction requires large investments, and all decisions influencing the cost of tunnel construction and maintenance should be based on reliable estimates. Since 30% to 50% of the total tunnel costs is accounted for by the cost of rock excavation, the reliability of estimating the quality and quantity of different rock classes in a specific project is an important problem to solve. This paper provides an answer to this and some other problems, focusing on reliability of geologic prediction in tunneling, geotechnical rock classification, statistically-based estimates of rock classes. A New Austrian Tunneling method (NATM) is described 8 refs.

DESCRIPTORS: (\*TUNNELS AND TUNNELING, \*Costs), (ROCK DRILLING, Costs), (ROCK MECHANICS, (GEOLOGY, Engineering), CARD ALERT 401, 405, 911, 483, 481

937829 ID NO. E1790537829  
**NEW SOIL-REINFORCEMENT INTERACTION MODEL.**

Salomone, William G; Holtz, Robert D; Kovacs, William D. Purdue Univ, West Lafayette, Indiana  
Symposium on Earth Reinf., Proc of a Symp at the ASCE Annu Conv, Pittsburgh, Pa, Apr 27 1978 Publ by ASCE, New York, Nr, 1979 p 714-73

The soil-reinforcement interaction mode) described in this paper provides an alternative approach for obtaining the distribution of tensile force in the reinforcement. All that is required is an estimate of the maximum tensile force in the reinforcement, along with its geometry and mechanical properties. For design, for example, the maximum force in the reinforcement can be estimated at failure by the Rankine or Coulomb theory for retaining structures or for embankments on soft foundations by elastic theory or by probability theory. The significance of the new approach is that the tensile force distributions also can be predicted for conditions other than failure. To illustrate how the new analytical procedure predicts the distribution of tensile force on the reinforcement, results of full scale pullout tests at a reinforced earth retaining wall in California were compared with the new theory. 12 refs

DESCRIPTORS: (\*SOIL MECHANICS, \*Stabilization), (MATHEMATICAL MODELS, (SOILS, Stabilization), RETAINING WALLS, (EMBANKMENTS, Foundations), IDENTIFIERS: SOIL-REINFORCEMENT INTERACTION, REINFORCED EARTH CARD ALERT: 483, 931

937286 ID NO. E1790537286  
**EARTHQUAKE RESISTANT REINFORCED EARTH WALLS.**

Richardson, Gregory N. NC State Univ, Raleigh  
Symposium on Earth Reinf., Proc of a Symp at the ASCE Annu Conv, Pittsburgh, Pa, Apr 27 1978 Publ by ASCE, New York, Nr, 1979 p 664-68

The paper proposes a simple design procedure for evaluating dynamic force magnitudes in each reinforcing strip in such structures. This new design procedure incorporates data from earlier tests by other researchers and from subsequent laboratory shake table tests performed to measure the influence of the reinforcement distribution on the dynamic response of reinforced earth walls. The seismic design procedure is postulated based on the observed influence of reinforcement distribution and correlation with data from the earlier full-scale test wall. The proposed seismic design procedure also incorporates statistical response spectra to model earthquake ground motions for seismic magnitudes ranging from M<sub>s</sub> 0 to M<sub>s</sub> 5. Sufficient design aids are provided such that a complete seismic design can be accomplished using hand calculations. The proposed seismic design procedure is also applicable if an actual design acceleration time-history is available for the site. 11 refs.

DESCRIPTORS: (\*RETAINING WALLS, \*Design), EARTHQUAKE RESISTANCE, (SOILS, Stabilization), SOIL MECHANICS, IDENTIFIERS: REINFORCED EARTH WALLS CARD ALERT 405, 483, 484

926342 ID NO - E1790336342  
**SIMULATION OF RANDOM PACKING OF SPHERES.**

Jodrey, W. Steven; Torv, Elmer M.  
Mt Allison Univ, Sackville, NB  
Simulation v 32 n 1 Jan 1979 p 1-12 CODEN: SIMUA2  
ISSN 0037-5497

PACKS simulates the very slow settling of rigid spheres (as in sedimentation) from a dilute suspension into a randomly packed bed. Spheres are introduced one at a time in a potential field and fall or roll until they occupy one of the available sites. The position of an incoming sphere is calculated at each of the significant events in its history. Thus, probabilities for each site are assigned on a realistic basis. Packings of 100,000 or more spheres are feasible. The simulation has potential applications in crystallography, soil engineering, biology, nuclear engineering, and petroleum engineering. 31 refs.

DESCRIPTORS: (\*PACKING, \*Computer Simulation), SUSPENSIONS, SEDIMENTATION, (PROBABILITY, Random Processes), CRYSTALLOGRAPHY, SOIL MECHANICS.  
IDENTIFIERS: SPHERES, PACKED BEDS  
CARD ALERT: 619, 723, 801, 922, 931

928723 ID NO - E1790428723

**ESTIMATE OF SOIL COMPRESSIBILITY FROM STANDARD PENETRATION TEST.**

El-Moursi, Houssein H.; Krizek, Raymond J.; Corotis, Ross B.  
Soil Test Serv of Iowa Inc, Cedar Rapids  
Geotech Eng v 9 n 1 Jun 1978 p 1-12 CODEN: GIEGB2

A probabilistic model is developed to relate the compressibility of a soil deposit to blow counts obtained from standard penetration tests. The established relation is based on a variable proportionality coefficient, the value of which depends on the nature of the soil. The variations in the blow count and the proportionality coefficient are examined through the calculated statistical parameters, and it is found that these variations can be explained in terms of a normal probability distribution. The method of derived distributions is then used to develop a probabilistic model for predicting the total settlement in a compressible clay layer in terms of uncertain standard penetration test results and loads. The compression ratio is found to be well described by a normal distribution, and the total settlement is likewise well approximated by a lognormal distribution.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Mathematical Models), STATISTICAL METHODS, (FOUNDATIONS, Settlement).  
CARD ALERT 483, 931, 922, 405

928722 ID NO - E1790428722

**VARIABILITY OF SOIL STRENGTH AND ITS CONSEQUENCES ON THE RELIABILITY OF STRUCTURES ON GROUND.**

Athanasou, Grivas, D  
Rensselaer Polytech Inst, Troy, NY  
Dev in Theor and Appl Mech v 9; Proc of the Southeast Conf

on Theor and Appl Mech (SFCTAM), 9th, Nashville, Tenn, May 4-5 1978. Sponsored by Vanderbilt Univ, Nashville, Tenn, 1978 p 487-496

A probabilistic model is presented for the determination of the reliability of structures founded on ground. The bearing capacity of the foundation material is assumed to be a random variable following a general beta distribution. The same model is also used to describe the variation of the applied load. The statistical values of both bearing capacity and applied load are found through an application of the \$left double quote\$ error propagation method \$right double quote\$. An attempt is made to develop relationship between the conventional factor of safety and the probability of failure. The results are illustrated in a case study. 9 refs

DESCRIPTORS: \*SOIL MECHANICS, (FOUNDATIONS, Bearing Capacity),  
CARD ALERT: 405, 483, 493

928208 ID NO - E1790428208

**STATISTICAL REPRESENTATION OF JOINT ROUGHNESS.**

Wu, Tien H.; Ali, Elfatih M.  
Ohio State Univ, Columbus  
Int J Rock Mech Min Sci Geomech Abstr v 15 n 5 Oct 1978 p 259-262 CODEN: IRMG8G

Quantitative measures of joint roughness are used to compare different surface characteristics. After considering the roughness profile as a signal in the time space, the techniques of time series are employed to describe the signal characteristics. 6 refs.  
DESCRIPTORS: (\*ROCK MECHANICS, \*Testing), (GEOLOGY, Engineering),  
CARD ALERT 483, 502, 481

920329 ID NO. E1790320329  
**RESILIENT RESPONSE OF TWO FROZEN AND THAWED SOILS**  
Chamberlain, Edwin J.; Cole, David M.; Johnson, Thaddeus C.  
US Army Cold Res & Eng Lab, Hanover, NH  
ASCE J Geotech Eng Div v 105 n 2 Feb 1979 p 257-271  
CODEN AJGFB6

Values of resilient modulus and Poisson's ratio were determined for silt and clay subgrade materials subjected to seasonal freezing and thawing. A new technique employing non-contacting variable impedance transducers was employed to obtain axial strain data for calculation of Poisson's ratio. The data were analyzed using multiple linear regression and analysis of variance techniques to obtain empirical relationships between the resilient moduli and Poisson's ratio parameters and stress and material property variables. Resilient modulus data ranged from over 6,000,000 psi for the frozen condition to less than 600 psi for the thawed condition. Poisson's ratio ranged from 0.07 to 0.61, the majority of the values falling between 0.30 and 0.50. 13 refs.  
DESCRIPTORS: (\*SOILS); (\*FROZEN); (ROADS AND STREETS); FROST EFFECTS; PAVEMENTS; SOIL MECHANICS; STATISTICAL METHODS; IDENTIFIERS; THAWING; TRIAXIAL TESTS  
CARD ALERT 406, 483, 922, 931

920330 ID NO. E1790320330  
**RELIABILITY ANALYSIS OF SLOPES: FREQUENCY-DOMAIN METHOD**  
Veneziano, Daniele; Antoniano, Jaime  
MIT, Cambridge, Mass  
ASCE J Geotech Eng Div v 105 n 2 Feb 1979 p 165-182  
CODEN AJGFB6

In previous works, slope reliability against three-dimensional failures has been approached by space-domain methods. System reliability becomes tractable if second-moment uncertainty on shear resistance is characterized and analyzed in the frequency domain (i.e., in terms of the spectral density function and not of the covariance function). The main features of the frequency method proposed here are: (1) Modes of failure are unrestricted within the class of plastic shear mechanisms; (2) a shear resistance is treated as a random field in three dimensions; the field must be homogeneous in the longitudinal direction (along the slope) but may be nonhomogeneous in transversal sections; (3) the probability distribution of modal resistance can be either normal or lognormal. Application to cylindrical failures in vertical cuts confirms that reliability is sensitive to uncertainty on the mean of the shear resistance field as well as to the scale parameters of the shear resistance correlation function. High sensitivity is found also with respect to the distribution, normal or lognormal, of modal resistance. Cut length is another important parameter. 17 refs.  
DESCRIPTORS: (\*SOIL MECHANICS); (\*STABILITY); (STRUCTURAL DESIGN, Safety Factor); MATHEMATICAL MODELS; PROBABILITY; IDENTIFIERS; SLOPE STABILITY  
CARD ALERT 408, 483, 921, 922

920300 ID NO. E1790320300  
**PROBABILISTIC EVALUATION OF LIQUEFACTION POTENTIAL**  
Haldar, Achintya; Tang, Wilson H.  
Ill Inst of Technol, Chicago  
ASCE J Geotech Eng Div v 105 n 2 Feb 1979 p 145-163  
CODEN AJGFB6

A procedure for predicting probability of liquefaction is used to estimate the probability of liquefaction for a given design earthquake magnitude and acceleration or when the earthquake loading is considered as random. Reasonable comparison is obtained between the probabilities computed and the field observations of liquefaction occurrences. Uncertainty analysis of the Seed and Idriss simplified method reveals that the uncertainties in the load parameters exceed those in the resistance parameters. Thus, the seismic activity of the region should be given serious consideration, as well as the attenuation characteristics. When the maximum acceleration and earthquake magnitude are specified, the probability of liquefaction will be governed by the uncertainties in the relative density and cyclic shear strength parameters. As an alternative tool of analysis the probabilistic model could complement the deterministic procedures by providing information on the relative risk of liquefaction between design alternatives.  
DESCRIPTORS: (\*SOIL MECHANICS); (SOILS); (EARTHQUAKE RESISTANCE); STATISTICAL METHODS; PROBABILITY; EARTHQUAKES; IDENTIFIERS; LIQUEFACTION  
CARD ALERT 483, 484, 922, 931

912295 ID NO. EI790212295  
QUANTITATIVE MODEL OF DILATANCY IN DRY ROCK AND ITS  
APPLICATION TO WESTERLY GRANITE.

Holcomb, David J  
Univ of Colo, Boulder  
J Geophys Res v 83 n B10 Oct 10 1978 p 4941 4950 CODEN  
JGURE2

A general model of dilatancy was developed based on the behavior of individual microcracks. Macroscopic effects were described by combining the effects of individual cracks using a statistical approach. The model was developed using a distribution function for crack size, crack strength, and local stress. Hysteresis in volumetric strain and stress-strain data for partial unloading and reloading and general loading paths can be described. The model is best suited to describing rock which has been subjected to a number of loading cycles sufficient to remove the residual volumetric strain that is present in the initial cycles. Some aspects of the crack behavior that were necessary to explain the data are incompatible with the usual sliding crack model of dilatancy. Combined with the lack of observable shear cracks, this casts serious doubts on the validity of the sliding crack model. 16 refs.

DESCRIPTORS \*ROCK MECHANICS.  
CARD ALERT 483, 502

911273 ID NO. EI790211273  
PROBABILISTIC CONSIDERATIONS IN THE FOUNDATION ENGINEERING  
FOR OFFSHORE STRUCTURES.

Hoeg, K.; Tang, W. H.  
Norw Geotech Inst, Oslo  
Nor Geotek Inst Publ n 120 1978 29 p CODEN NGIPRZ  
The type of offshore structure that may safely and economically be installed at a given site depends to a large extent on the local soil conditions. Foundation soil behavior has to be analyzed for large cyclic loads superimposed on the static ones. Experimental results from soil elements subjected to cyclic loads in the laboratory show substantial scatter, which gives rise to large uncertainties in the analytical predictions of field performance. A systematic evaluation of the reliability of present practice and available engineering analyses starts by comparing before the event predictions to field measurements. The paper attempts to give an overview of the geotechnical engineering performed for offshore gravity structures and to point out to what extent theories of probability and statistics so far have been used. Specific cases are considered for probabilistic analyses of the platform installation phase and foundation stability during storm loading. 16 refs.  
DESCRIPTORS \*OFFSHORE STRUCTURES. \*foundations).  
PROBABILITY. SOIL MECHANICS.  
CARD ALERT 674, 483, 922

STATISTICAL VARIATION IN STRESS-VOLUMETRIC STRAIN BEHAVIOR  
OF WESTERLY GRANITE.

Costantino, Marc S.  
Univ of Calif, Lawrence Livermore Lab  
Int J Rock Mech Min Sci Geomech Abstr v 15 n 3 Jun 1978 p  
105-111 CODEN JMRGPG

A lower bound was determined for the experimental uncertainty caused by left double quotes natural rock variability. Right double quotes in measurements of stress-volume strain. Ten similar, hydrostatic and triaxial compression experiments were performed on the granite. The uncertainty owing to rock variability was estimated by intermingling the mean and standard deviations of the volume strains at several stresses. Standard deviations of the order of 10-20% of the mean volume strains were found. The standard deviation of the mean for the volume strains, however, ranges from 3 to 9%. Relative to many other rocks, Westerly granite is very homogeneous, isotropic and otherwise well behaved. Therefore, these estimates of scatter that, for the most part, result from rock variability should be near a lower bound, for strain properties of other less well-behaved rocks. Deviations from mean values are expected to be larger. For evaluation of a model or theory that purports to describe a mechanical property, average values obtained from a large number of similar experiments are required. While it is reasonable to suppose that results from a single experiment will be close to the average value for the group, caution should be used in attempting to force models to fit, in discarding theories that do not fit, or in drawing conclusions from the results of a single experiment. 7 refs.

DESCRIPTORS (\*ROCK \*Testing). (MATERIALS TESTING, Plasticity), ROCK MECHANICS.  
IDENTIFIERS: STRESS-VOLUMETRIC STRAIN BEHAVIOR  
CARD ALERT: 483, 502, 505, 421, 422

44453 ID NO - E178014533  
**SEISMIC SOIL-CONTAINMENT INTERACTION: PIPE SAFETY**

Forbes, Michael N., Cornell, C. Allan  
MIT, Cambridge, Mass  
ASCE J Eng Mech Div v 104 n 6 Dec 1978 p 1753-1770 CODEN  
JMCEA3

The integrity of pipes penetrating the containment wall of a nuclear power plant may be threatened by seismic motions of the containment vessel. Within the context of an integrated accident and seismic containment reliability study, a methodology is presented for the determination of the probability of failure of a single pipe and of a system of pipes, as a function of the causative ground acceleration. Extreme rocking displacements of the containment under earthquake intensities well beyond the design level are estimated by means of a simple model that takes into account the possibility for soil-base separation and the multidirectionality of the ground motion. The final reliability estimates reflect a large number of uncertainties, most of which are of statistical nature, i.e., stemming from the limited information about soil properties, details of the seismic motion, and resistance of the pipes. The correlation between failures of apparently redundant pipes that is introduced by the common dependence on system-wide uncertainties is illustrated. 17 refs

DESCRIPTORS (+PIPELINES, +Earthquake Resistance), ( FOUNDATIONS, Soil Structure Interaction), SOIL MECHANICS, ( STRUCTURAL DESIGN, Safety Factor), (MATHEMATICAL MODELS, CONTAINMENT WALLS).  
CARD ALERT 405, 408, 483, 484, 619, 921

894348 ID NO - E1781294348  
**SITE DEPENDENT EARTHQUAKE MOTIONS**

Romstad, Karl M., Bruce, John, Hutchinson, James R  
Univ of Calif, Davis  
ASCE J Geotech Eng Div v 104 n 11 Nov 1978 p 1390-1400  
CODEN AJGEP6

A statistical method for modeling time varying earthquake induced acceleration levels which will produce smooth response spectrums of the desired shape and amplitude levels is developed. Specific records are derived to simulate a mean spectrum developed from historically recorded rock motions and also for AEC regulatory guide spectrum. The synthetic rock motion is then used as the input motion to a number of site conditions simulating stiff, deep cohesionless and soft to medium clay and sand sites using the computer program SHAKE. The results are compared to mean spectra for similar sites derived from historically recorded motions and shown to provide reasonable engineering estimates of site motions. 14 refs

DESCRIPTORS (+STRUCTURAL DESIGN, +Earthquake Resistance), SOIL MECHANICS, STRUCTURAL ANALYSIS, MATHEMATICAL MODELS, IDENTIFIERS, GROUND MOTION, EARTHQUAKE RESISTANT STRUCTURES  
CARD ALERT 408, 483, 484, 921, 931

866904 ID NO - E178086904  
**USE OF NUMERICAL AND STATISTICAL METHODS TO DETERMINE THE INITIAL STATE OF STRESS IN ROCK**

Pagev, S. N  
Inst of Min, Sib Branch of the Acad of Sci of the USSR,  
Novosibirsk

Sov Min Sci v 13 n 3 May Jun 1977 p 307-310 CODFN SWSAT  
An approach to the determination of the initial state of stress in rock in the neighborhood of a measurement bore-hole by the perturbation method is proposed in which construction of a scheme of calculation for any particular variant essentially reduces to numerical solution of the appropriate direct problems of the theory of elasticity. 3 refs  
DESCRIPTORS (+ROCK MECHANICS, +Stresses), (STRESSES, Measurements), (MATHEMATICAL TECHNIQUES, Numerical Methods), STATISTICAL METHODS.  
CARD ALERT 483, 502, 421, 921, 922

853571 ID NO - E1780753571  
**CONSOLIDATION SEM DASH'S PROBABILISTIC APPROACH**

Athanasou-Grivas, Dimitri, Harr, Milton E.  
Rensselaer Polytech Inst, Troy, N.Y.  
ASCE J Eng Mech Div v 104 n 3 Jun 1978 p 681-690 CODEN  
JMCEA3

In the present work one-dimensional consolidation is treated as a phenomenon of diffusion and the governing physical equation is derived using probabilistic considerations. The similarity between diffusion of solids in a field of water and that of a substance dispersed in a liquid is exploited to determine the analytical expression of the coefficient of diffusion. Differences between laboratory and field conditions are considered for the prediction of the expected rates of dissipation of pore water pressure. Finally, a simple scaling procedure is presented, of time to space increments, to provide recurrence formulas. 8 refs.  
DESCRIPTORS (+SOILS, +Consolidation), MATHEMATICAL MODELS, PROBABILITY, SOIL MECHANICS, STATISTICAL METHODS, IDENTIFIERS, PROBABILITY THEORY, SCALE EFFECT  
CARD ALERT 483, 921, 922, 931

853074 ID NO - E1780753074  
**PROBABILITY ANALYSIS OF ROCK SLOPES AND ITS APPLICATION TO A PIT SLOPE DESIGN.**

Young, Dale S.  
Kennecott Copper Corp., Met Min Div-Eng Cent., Salt Lake, City, Utah  
Proc Symp Rock Mech 18th: Keystone, Colo., Jun 22-24 1977.  
Publ by Colo Sch of Mines Press., Golden, 1977 v 1 p 5C5.  
1-5C5. 6. CODEN: PSRMA6

A statistical method of slope analysis is developed in this paper, which will determine the probability of a slope failure. This method is based on a probability analysis of rock sample strengths and involves the back-calculation method to derive the necessary strength values. A case study is given for slope design in a copper mine. It illustrates how the progressive probability areas of various sample sizes can be drawn and when the actual convergence limit of the areas is reached, and the true probability area. The sensitivity of pore pressure on the probability of failure for the slope is tested to analyze its impact on stability. 5 refs  
DESCRIPTORS: \*ROCK MECHANICS, COPPER MINES AND MINING, IDENTIFIERS, PIT SLOPE DESIGN  
CARD ALERT: 483, 502, 504

853072 ID NO - E1780753072  
**STATISTICAL DESCRIPTION OF ROCK PROPERTIES AND SAMPLING.**

Baecher, G. B.; Lanney, N. A.; Einstein, H. H.  
MIT, Cambridge, Mass  
Proc Symp Rock Mech 18th, Keystone, Colo., Jun 22 24 1977.  
Publ by Colo Sch of Mines Press., Golden, 1977 v 1 p 5C1  
1-5C1. 8. CODEN: PSRMA6

Statistical description of rock mass properties is essential for two reasons. (1) Analyses in rock engineering require statistical descriptions to take the distributive character of properties into account, and (2) Field sampling requires statistical descriptions to develop sampling plans and to draw inferences from data. For both purposes, it is essential to know appropriate distributions of rock mass properties. Based on the evaluation of a large number of joint data and taking previous work into account, it was determined that the best fitting distribution for joint  $\phi$  is lognormal and for joint length  $\phi$  is lognormal. Based on these conclusions, a model was developed for inferring joint set parameters and for estimating the intensity of jointing (joint surface area per volume) from outcrop data. 15 refs.  
DESCRIPTORS: \*ROCK MECHANICS, (GEO)PHYSICS, Rock Properties, STATISTICAL METHODS.  
CARD ALERT 483, 502, 481, 322

853055 ID NO - E1780753055  
**PROBABILITY OF SPECIFIED GROUND VIBRATIONS FROM BLASTING.**

Lutton, Richard J.  
US Army Eng Waterw Exp Svn, Soils & Pavements Lab, Vicksburg

Proc Symp Rock Mech 18th: Keystone, Colo., Jun 22-24 1977.  
Publ by Colo Sch of Mines Press., Golden, 1977 v 1 p 3C2.  
1-3C2. 7. CODEN: PSRMA6

The distribution of peak particle velocity ( $V_{max}$ ) from construction blasting appears to be approximately log-normal so that the probabilities of exceeding specified levels should be approximately predictable. Separate models of  $V_{max}$  distribution are presented for presplit (confined) and delayed shots. The preferred scaling factor operating on charge weight per delay is  $n$  equals  $1/3$ . 7 refs.  
DESCRIPTORS: (\*ROCK, \*Blasting), VIBRATIONS, ROCK MECHANICS, CARD ALERT: 483, 405, 502, 931

850077 ID NO - E1780750077  
**BESTIMMUNG DER ROHRDICHTE NICHTBINDIGER LOCKERGESTEINE BEI GENEIGTER GELANDEBERFLAECHE. (left brackets Determination of the Bulk Density of Cohesionless Soils in Inclined Ground Surface Right brackets)**

Knut, Elke; Reinhardt, Klaus  
Bauakad der DDR, Leipzig, E Ger  
Bauplanung Bautech v 32 n 1 Jan 1978 p 11-12 CODEN:  
BABAAI

The statistical evaluation of the results of investigation on soil structure interaction showed that the method used for testing made it possible to obtain acceptable qualitative and quantitative classification of different compression and tamping technologies. 12 refs. In German.  
DESCRIPTORS: (\*FOUNDATIONS, \*Soil Structure Interaction), SOIL MECHANICS, (SOILS, Testing),  
CARD ALERT: 405, 483, 931

845637 ID NO: E1780615637  
**MEASUREMENT AND PREDICTION OF VIBRATIONS GENERATED BY DROP HAMMER PILING IN BANGKOK SUBSOILS**

Brenner, R. Peter; Viranwut, Suwit  
Asian Inst of Technol, Bangkok, Thailand  
Southeast Asian Conf on Soil Eng, 5th, Proc, Bangkok, Thailand, Jul 2-4 1977 Publ by Asian Inst of Technol, Bangkok, Thailand, 1977 p 105-119

A large number of vibration measurements on the ground surface and on an adjacent building were performed in connection with pile driving activities on a site north of Bangkok, Thailand. Vibration intensity was expressed in terms of peak particle velocity. A statistical comparison with previously collected data from other sites in the Bangkok area revealed that vibrations generated by driving a pile into one of the bearing strata commonly used for founding piles in this region, i.e., stiff clay or the underlying sand, are not of significantly different magnitude. A previously recommended upper bound for vibrations to be expected could be confirmed. A multiple correlation with penetration data obtained from Dutch cone tests at the site and pile driving records was also attempted but the only variable giving a significant contribution was the cone resistance. Refs  
DESCRIPTORS (\*SOILS, \*Vibrations), (PILES, Driving), SOIL MECHANICS.

CARD ALERT 483, 931

837689 ID NO: E1780537689  
**SEISMIC GROUND MOTION PARAMETER RELATIONS**

McGuire, Robin K  
US Geol Surv, Denver, Colo  
ASCE J Geotech Eng Div v 104 n 4 Apr 1978 p 481-490  
CODEN AJGEB6

The relationships among spectral velocity for 0.5 Hz and 1.0 Hz frequencies, peak ground acceleration, and peak ground velocity of earthquake-induced ground motion are investigated using the horizontal components of motion from 70 California strong-motion records and accounting for event size, source-to-site distance, and geologic conditions at the recording site. These strong motion records indicate that the estimation of intermediate-frequency spectral response using ground acceleration and typical design spectra is unconservative for a large, distant event (magnitude 8 plus 120-km epicentral distance) by a factor of about 2 to 6, depending on the site geology. Ground velocity can be used to estimate intermediate frequency spectral response; however, expected spectral response will exceed these estimates during the motion from large, distant events by a factor of about 1.4 to 2.5. Because of the large variabilities associated with strong motion data, these results are tentative.  
DESCRIPTORS \*SOIL MECHANICS, (BUILDINGS, Earthquake Resistance), EARTHQUAKES, STATISTICAL METHODS.

CARD ALERT 402, 483, 484, 922, 931

81812 ID NO: E1780533812  
**CONTACT SHEAR DISTRIBUTION UNDER MACHINE FOUNDATION**

Sankaran, K. S.; Subrahmanyam, M. S.; Rama Sastri, K.  
Indian Inst of Technol, Madras  
Int Symp on Soil Struct Interaction, Univ of Roorkee, India, Jan 3-7 1977 Publ by Abhay Rastogi for Sarita Prakashan, Meerut, India, 1977 p 405-412

This paper deals with analytical solutions, their numerical evaluations and corresponding design curves for annular ring uniform contact shear distribution for predicting resonant frequency and peak amplitude of footings resting on soil surface and subjected to horizontal vibrations. The analysis is based on elastic half-space theory. The analytical solutions compare well with field tests and suggest the probability of prediction of machine foundation response from a single field vibration test.  
DESCRIPTORS (\*FOUNDATIONS, \*Soil Structure Interaction), (MACHINERY, Foundations), SOIL MECHANICS, VIBRATIONS, (CARD ALERT 405, 483, 931

829238 ID NO: E1780429238  
**FINITE ELEMENT RANDOM VIBRATION METHOD FOR SOIL-STRUCTURE INTERACTION ANALYSIS**

Romo Organista, M. P.; Lymer, J.; Seed, H. B.  
Univ of Calif, Berkeley  
Trans of the Int Conf on Struct Mech in React Technol, 4th, K(a); Seism Response Anal of Nucl Power Plant Syst, San Francisco, Calif, Aug 15-19 1977 Publ by Commun of the Eur Communities, Luxemb, 1977 Pap K 2/3, 12 p

An analytical method of earthquake motions is presented which retains the randomness in both the definition of the design motion and the computed response. The seismic environment is defined directly in terms of the given design response spectrum. By using extreme value theory a new procedure has been developed for converting the design response spectrum into a design power spectrum. Knowing the design power spectrum, the resulting output power spectra and their statistical distribution can be computed by a response analysis of the soil-structure system in the frequency domain, most conveniently done by the finite element method. These spectra can be used to determine statistical information about the response such as maximum accelerations, stresses, bending moments, etc., all with confidence limits. 15 refs.  
DESCRIPTORS \*SOIL MECHANICS, EARTHQUAKES, (PROBABILITY, Random Processes), COMPUTER PROGRAMMING, (MATHEMATICAL TECHNIQUES, Finite Element Method), VIBRATIONS.

CARD ALERT 483, 484, 723, 921, 931

827421 ID NO E1780427421  
**CRITERIA FOR THE GENERATION OF SPECTRA CONSISTENT TIME HISTORIES.**

Lin, C. W.  
Westinghouse Electr Corp, Pittsburgh, Pa  
Trans of the Int Conf on Struct Mech in React Technol, 4th, V 1(A) Seism Response Anal of Nucl Power Plant Syst, San Francisco, Calif, Aug 15 19 1977 Publ by Commn of the Eur Communities, Luxemb, 1977 pap K 1/11, 8 p  
The response spectrum technique has been widely adopted for the linear type of seismic analysis of nuclear power plants. However, the time history approach is viable where the response has to be computed as a function of time. Given a design response spectrum, a nearly unlimited number of synthesized time history motions can be constructed. Time histories having frequency content higher than indicated by real earthquake records may have adverse influence on the system response. Other time histories may have unnecessarily long duration, which makes a large and detailed analytical model uneconomical. 15 refs

DESCRIPTORS (\*NUCLEAR REACTORS, \*Earthquake Effects, SOIL MECHANICS, STATISTICAL METHODS, VIBRATIONS).  
CARD ALERT 483, 484, 621, 922, 931

821430 ID NO E1780321430  
**APPLICATION OF RISK ANALYSIS TO THE PREDICTION OF SLOPE INSTABILITY.**

Young, R. N.; Alonso, F.; Tabba, M. M.; Framingham, P. B.  
McGill Univ, Montreal, Que  
Can Geotech J v 14 n 4 Nov 1977 p 540-553 CODEN CGJGJAH  
The problem of the prediction of stability or instability of natural clay slopes is examined in view of the random intrinsic nature of both soil properties and external actions. The probabilistic method of analysis appears to be a useful tool, which not only could account for these random properties but also could consider uncertainties derived from incomplete knowledge of pertinent model parameters and conditions of stability. Using the familiar method of slices, the different sources of error have been incorporated into a first order probability analysis of the simplified Bishop model in order to arrive at quantitative information concerning the probability of failure. Field and laboratory data from an instrumented test valley slope in the Ottawa region have been considered to arrive at an instability risk prediction of the test slope. The mean functions of the strength parameters have been made explicitly dependent on a number of statistical parameters to emphasize dependence on available data. Refs

DESCRIPTORS (\*SOIL MECHANICS, \*Stability), PROBABILITY, CLAY, IDENTIFIERS, SLOPE STABILITY, CLAY SLOPES, RISK ANALYSIS  
CARD ALERT 483, 931, 922

Kurobe, Keiji; Ohira, Yoshimori  
Natl Def Acad, Yokosuka, Jpn  
Can Geotech J v 14 n 4 Nov 1977 p 562-570 CODEN CGJGJAH  
Statistical techniques are used to forecast the compressibility of peaty ground. Based on data from more than 100 consolidation tests on undisturbed samples of peat and underlying clay, various regression equations are developed to estimate the compression index. In terms of more easily determined soil index properties, it is found that the compression index can be reasonably well approximated by the use of a simple linear regression model involving the natural water content and the natural void ratio. These regression equations are then compared with those that have been reported by other investigators. These regression equations may permit a preliminary estimation of the settlement of peaty ground.

DESCRIPTORS (\*SOIL MECHANICS, \*Consolidation), (PEAT, Mechanical Properties), STATISTICAL METHODS.  
CARD ALERT 483, 931, 922

813769 ID NO E1780213769  
**PROBABILITY MODELS OF UNDRAINED STRENGTH OF MARINE CLAY LAYER.**

Matsuo, Minoru; Asakura, Akira  
Nagoya Univ, Jpn  
Soils Found v 17 n 3 Sep 1977 p 53-68 CODEN SOIFEB  
A probability model of the undrained strength of saturated clay which can correctly represent the heterogeneity and is indispensable for the reliability-based design of a soft ground is presented. The variability of undrained strength is analyzed quantitatively from two points of view. One aspect is concerned with the variability due to sample disturbance which is inevitable at sampling and testing of soils. The other is the inherent heterogeneity of a natural ground. The ratio of strength of a disturbed sample to that of a perfect one is formulated by a probabilistic function of the disturbance ratio. The inherent variability of undrained strength is analyzed based on the perturbation of consolidation pressure due to heterogeneity of a ground. The final probability model of measured undrained strength is obtained by convolution of those two kinds of variability. 20 refs

DESCRIPTORS (\*SOILS, \*Consolidation), CLAY, MATHEMATICAL MODELS, PROBABILITY, STATISTICAL METHODS, SOIL MECHANICS, IDENTIFIERS, SATURATED CLAY, SOFT GROUND, HETEROGENEITY, CLAY STRENGTH  
CARD ALERT 483, 921, 922, 931

821436 ID NO E1780321436  
**STATISTICAL FORECASTING OF COMPRESSIBILITY OF PEATY GROUND.**

new concepts and methods for modeling the natural variability of soil properties are presented and illustrated by the proposed technique of modeling the statistical character of soil profiles. A dual function (1) it provides a format for quantifying the information gathered during site investigation and testing, about the subsurface conditions at various depths and (2) it provides the basis for predicting performance and for quantifying the reliability of performance. Probabilistic soil profiles are characterized, first, by best estimates of layer depths and of pertinent engineering properties, and secondly, by the coefficient of variation and the correlation scales for the profile parameters of interest. Methodology is developed for dealing with problems that can be formulated in terms of extremes of soil properties. The problems of limit equilibrium slope stability and differential settlement are also included in this category. 18 refs.

DESCRIPTORS: (1) SOILS, (2) TESTING, SOIL MECHANICS, MATHEMATICAL MODELS, PROBABILITY, IDENTIFIERS, PROBABILISTIC MODELING, GEOTECHNICAL ENGINEERING, SOIL PROPERTIES

CARD ALERT 483, 921, 922, 931

793547 ID NO. E1774293547  
**SPT AND RELATIVE DENSITY IN COARSE SANDS**  
 Macoson, William F. III; Bieganski, Wayne A.  
 Soils and Pavements Lab., US Army Eng. Waterw Exp Stn., Jacksonburg, Miss.

ASCE J Geotech Eng Div v 103 n 11 Nov 1977 p 1295-1309  
 ODTN A192P6

The Standard Penetration Test (SPT) is critically examined with respect to its ability to estimate relative density in situ. SPT's were performed using field drilling equipment at three overburden pressures on 4 ft (1.22-m) diam by 6-ft (1.83-m) high test specimens constructed using Platte River and Standard Concrete sands at three relative densities. The results are presented as a family of curves correlating relative density with SPT N values for the three testing pressures. This research was an extension of a previous SPT test series on Sand Bedford Model and Ottawa sands. The results of testing the four sands were compared and a statistical analysis produced an empirical equation relating relative density to effective overburden pressure, N value, and coefficient of uniformity. Comparisons are also made between this work and the previous work of Gibbs and Holtz at the Bureau of Reclamation and Bazaraa at the University of Illinois. 16 refs.

DESCRIPTORS: (1) SOILS, (2) TESTING, SAND AND GRAVEL, MATERIALS TESTING, SOIL MECHANICS, IDENTIFIERS, RELATIVE DENSITY, PENETRATION TESTS

CARD ALERT 421, 423, 483, 931

805785 ID NO. E1774293548  
**UNDERGROUND PIPE DAMAGES AND GROUND CHARACTERISTICS**  
 Shimozaki, Masaharu; Kawakami, Tadashi  
 Columbia Univ., New York, NY  
 Tech Coun on Earthq Earthquake Eng Spec Conf, Proc, Calif State of Kwal of Lifeline Earthquake Eng, Univ of Calif, Los Angeles, Aug 30-31 1977 Publ by ASCE, New York, NY, 1977 p 293-307

A method is proposed under the quasi-elastic state at free field conditions to evaluate the elastic surface strains arising from spatial variability of the soil property (ground predominant frequency) of a surface layer subjected to shear waves, incident vertically from below through a semi-infinite firm ground. The variability is described in terms of a random function of the space variable characterized by mean value, variance and correlation distance. Applying the method, the strains are evaluated for the metropolitan Tokyo area on the basis of the local soil conditions, and a reasonable correlation has been established between such strains and the damage statistics collected on the underground water supply pipelines under the 1923 Kanto Earthquake. 5 refs.

DESCRIPTORS: (1) WATER PIPELINES, (2) Earthquake Resistance, SOIL MECHANICS, MECHANICAL WAVES, (PIPELINES, ANALYSIS), MATHEMATICAL MODELS, IDENTIFIERS, UNDERGROUND PIPES, SHEAR WAVES

CARD ALERT 445, 483, 484, 519, 921, 931

805786 ID NO. E1774293549  
**STABILITY ANALYSIS OF BANKS FOR ROADS BY STATISTICAL METHODS**  
 Nambu, Mitsuhiro; Karube, Daizo; Asano, Masayuki  
 Oyo Corp, Osaka, Jpn  
 Trans Jpn Soc Civ Engr v 7 Nov 1976 p 126-129 CODEN DCRDXY

A statistical analysis is presented of the data of bank slopes for roads, and consideration is given to the analysis of the present condition of bank slopes and the reasonability and improvement of the conventional design standards. Simultaneously, for the purpose of forecasting future disasters and estimating their scale, investigation is made of the correlation of the volume of falling soil with rainfall and value obtained by quantification analysis.

DESCRIPTORS: (1) ROADS AND STREETS, (2) Embankments, SOIL MECHANICS, STATISTICAL METHODS, EMBANKMENTS, IDENTIFIERS, STABILITY ANALYSIS

CARD ALERT 405, 406, 483, 922, 931

791548 ID NO. E1774293548  
**PROBABILISTIC MODELING OF SOIL PROFILES**  
 Vannorcel, Frank B  
 MIT, Cambridge, Mass  
 ASCE J Geotech Eng Div v 103 n 11 Nov 1977 p 1227-1246  
 ODTN A192P6

AD-A136 355

COMPENDIUM OF ABSTRACTS ON STATISTICAL APPLICATIONS IN  
GEO TECHNICAL ENGIN..(U) ARMY ENGINEER WATERWAYS  
EXPERIMENT STATION VICKSBURG MS GEOTE..

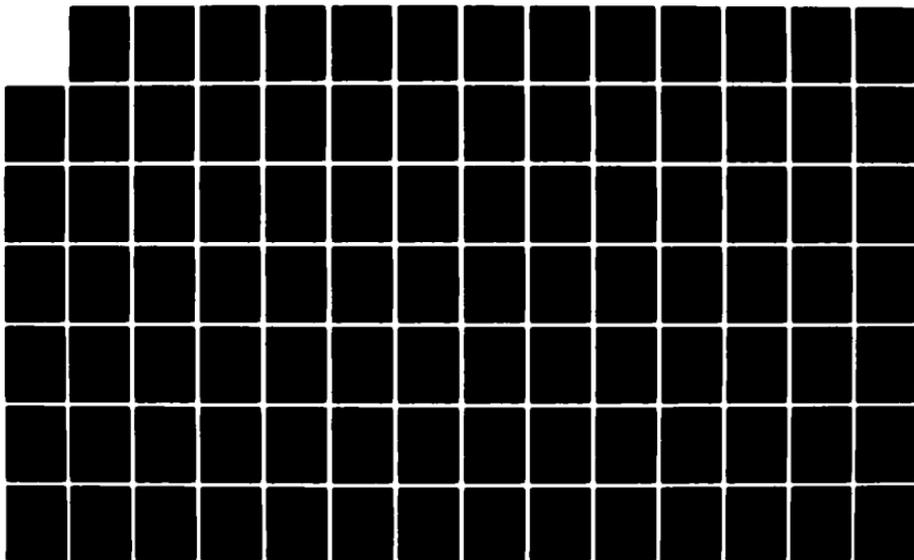
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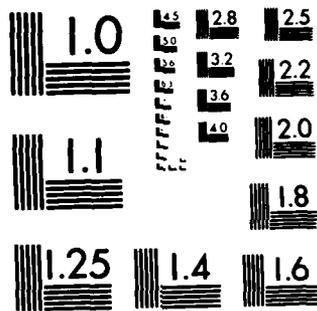
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M E HYNES-GRIFFIN ET AL. SEP 83

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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

792999 ID NO. - E1771292999  
ROCK SLOPES.

Hoek, Evert

Goldier Assoc Ltd, Vancouver, BC

Rock Eng for Found & Slopes, Proc of a Spec Conf, Univ of  
Colo, Boulder, Aug 15-18 1976 Publ by ASCE, New York, NY, 1976  
v 2 p 157-17

The paper discusses the subject in terms of the choice of  
shear strength values for use in stability analyses; the  
measurement and interpretation of groundwater conditions in  
rock slopes; the influence of accelerations due to  
earthquakes and large blasts upon slope stability; and the  
use of factor of safety or probability of failure as a basis  
for slope design. 10 refs.

DESCRIPTORS: (\*ROCK MECHANICS, \*Stability), (ROCK, Drainage)  
EARTHQUAKES, EXPLOSIONS.  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 483, 502, 931

785615 ID NO. - E1771185615

PROBABILISTIC SITE-DEPENDENT RESPONSE SPECTRA.

Kiremidjian, Anne S.; Shah, Hareesh C.

Stanford Univ, John A. Blume Earthquake Eng Cent, Calif

Annu ASCE Eng Mech Div Spec Conf, 2nd, Proc: Adv in Civ Eng  
through Eng Mech, NC State Univ, Raleigh, May 23-25 1977 Publ  
by ASCE, New York, NY, 1977 p 316-319

A method is presented for the evaluation of probability  
distributions on structural dynamic amplification factors and  
structural response spectra depending on the local soil  
conditions. From these distributions, risk-consistent  
structural response spectrum can be obtained for various  
future exposure time periods and a specified site. The method  
is then applied to a specific site in Southern California.  
Pseudo-absolute acceleration response spectra are determined  
for three types of soil conditions.

DESCRIPTORS: \*SOIL MECHANICS, (STRUCTURAL ANALYSIS, Dynamic  
Response), (STRUCTURAL DESIGN, Earthquake Resistance),  
PROBABILITY.

IDENTIFIERS: GROUND MOTION, SOIL RESPONSE SPECTRA

CARD ALERT: 483, 931, 408

780597 ID NO. - E1771180597

UNIFORM RISK ABSOLUTE ACCELERATION SPECTRA.

Anderson, John G.; Trifunac, M. D.

Univ of South Calif, Los Angeles

Annu ASCE Eng Mech Div Spec Conf, 2nd, Proc: Adv in Civ Eng  
through Eng Mech, NC State Univ, Raleigh, May 23-25 1977 Publ  
by ASCE, New York, NY, 1977 p 332-335

The seismic risk at a site can be presented as an absolute  
acceleration spectrum which has the property that the  
probability that it may be exceeded is independent of  
frequency. The paper calculates such a spectrum, called a  
uniform risk spectrum, using a scaling relationship of strong  
ground shaking that also considers the local site conditions

and the scatter of amplitudes about a mean attenuation curve.  
The shapes of uniform risk spectra adjust according to the  
seismicity distribution; the amplitudes are sensitive to the  
seismicity model used in the calculation.

DESCRIPTORS: (\*EARTHQUAKES, \*Analysis), PROBABILITY, SOIL  
MECHANICS.

IDENTIFIERS: SEISMIC RISK ASSESSMENT, GROUND ACCELERATION  
SPECTRA

CARD ALERT: 484, 931, 922, 483

780596 ID NO. - E1771180596

STUDY OF ATTENUATION PARAMETERS FOR CALIFORNIA.

Gurpinar, A.; Shah, H.; Savy, J.

Stanford Univ, John A. Blume Earthquake Eng Cent, Calif

Annu ASCE Eng Mech Div Spec Conf, 2nd, Proc: Adv in Civ Eng  
through Eng Mech, NC State Univ, Raleigh, May 23-25 1977 Publ  
by ASCE, New York, NY, 1977 p 324-327

The reliability of any seismic risk assessment depends  
essentially on the accuracy of the empirical models used to  
represent the deterministic and stochastic aspects of an  
earthquake. The attenuation law is one such relationship upon  
which the risk evaluation is very sensitive. While most  
commonly used attenuation parameters have been determined from  
peak ground acceleration (PGA), this study analyzes several  
alternatives and compares them with the PGA. Such  
alternatives include the peak ground velocity, the peak ground  
displacement, root mean square of acceleration (RMSA) and RMSA  
times the duration.

DESCRIPTORS: (\*EARTHQUAKES, \*Analysis), SOIL MECHANICS,  
PROBABILITY.

IDENTIFIERS: SEISMIC RISK ASSESSMENT

CARD ALERT: 484, 922, 483

768867 ID NO. - E1770968867  
SETTLEMENT IN SAND 3EM DASH# METHODS OF CALCULATING AND FACTORS AFFECTING.

Jorden, Eric E.  
Maritt Test Ltd, Halifax, NS  
Ground Eng v 10 n 1 Jan 1977 p 30-37 CODEN: GROEAV  
This paper tabulates the methods of calculating settlement in sand and reviews the factors affecting the magnitude of this settlement. The point is made that because the methods give different answers it is necessary to always calculate settlement using several methods. The Standard Penetration Test and the static Dutch cone test on which these methods are based have been standardized, but because of a crude understanding of the relationship between penetration resistance and compressibility (the test methods are not crude as has been suggested) the various methods give different answers for the magnitude of settlement. Penetration testing is the most practical means of assessing settlement in sand and comes closer to a statistical approach to the problem than more refined and expensive methods. 35 refs.  
DESCRIPTORS: (\*SAND AND GRAVEL, \*Consolidation), SOIL MECHANICS, SUBSIDENCE. (SOILS, Testing).  
CARD ALERT: 483

767054 ID NO. - E1770967054  
SELECT BERM WIDTH TO CONTAIN LOCAL FAILURES.

Martin, Dennis C.; Piteau, Douglas R.  
D. R. Piteau Assoc Ltd  
Eng Min J v 178 n 6 Jun 1977 p 161-164 CODEN: ENMJAK  
Stability analyses for open pit slope design must consider the possibility of the failure of individual benches as well as the failure of the overall slope. In many cases, the probability of overall slope failure along major faults or weak zones may prove to be small, while the design of individual benches against excessive failure may be the controlling factor for design of the overall slope. Small failures can cause major disruptions to pit operations and can limit accessibility. A graphical method for design of individual benches to control small failures is described here.  
DESCRIPTORS: (\*MINES AND MINING, \*Open Pit), ROCK MECHANICS, (SOILS, Stability).  
CARD ALERT: 502, 504, 505, 483

765632 ID NO. - E1770965632  
THEORY FOR SHEAR STRENGTH OF GRANULAR MATERIALS

Sadasivan, Sekanoor K.; Raju, Veegsna S.  
Reg Eng Coll, Srinagar, Kashmir, India  
ASCE J Geotech Eng Div v 103 n 8 Aug 1977 p 851-861  
CODFN AUGEB6  
Based on statistical methods, a theory has been proposed for the shear strength of a random assembly of spherical cohesionless particles. The theoretical analysis gives a relationship between angle of internal friction  $\phi_{int}$

$\phi_{int}/c/v$  at constant volume, interparticle friction angle  $\phi_{int}$   $\phi_{int}/s/\phi$ , and void ratio  $e$ . For comparison, drained triaxial compression tests have been carried out on steel spheres, uniform sands, and glass ballotini of different sizes. When  $\phi_{int}$   $\phi_{int}/s/\phi$  is calculated from the experimentally obtained  $\phi_{int}$   $\phi_{int}/s/c/v$  values it has been found that  $\phi_{int}$   $\phi_{int}/s/d$  theory could also be extended to random assemblies of irregular shaped particles as well. 23 refs.  
DESCRIPTORS: \*GRANULAR MATERIALS, FRICTION, SOIL MECHANICS, STATISTICAL METHODS.  
IDENTIFIERS: SHEAR STRENGTH, INTERNAL FRICTION, TRIAXIAL TESTS

CARD ALERT: 483, 922, 931

760820 ID NO. - E1770860820  
PROBABILISTIC ONE-DIMENSIONAL CONSOLIDATION

Freeze, R. Allan  
Univ of BC, Vancouver  
ASCE J Geotech Eng Div v 103 n 7 Jul 1977 p 725-742  
CODEN: AUGEB6  
The probabilistic analysis of one-dimensional consolidation requires as input the multivariate probability density function relating hydraulic conductivity, compressibility, and porosity. A Monte Carlo approach can be used to obtain solutions to hypothetical consolidation problems in which the soil properties are generated stochastically. Results show that the standard deviations associated with the input soil properties in heterogeneous soils can lead to large uncertainties in predicted hydraulic head values and consolidation rates. Uncertainties are increased by increasing soil heterogeneity and decreased by the presence of spatial trends. It appears that there is no simple way to define an equivalent homogeneous soil with single-valued average soil properties in heterogeneous soil systems. The practice, when utilized with the classical analytical solutions, may yield results significantly different from the most probable result for the actual stochastically-heterogeneous system. 24 refs.  
DESCRIPTORS: (\*SOILS, \*Consolidation), STATISTICAL METHODS, SOIL MECHANICS.  
IDENTIFIERS: GROUND WATER, MONTE CARLO METHOD, PERMEABILITY

CARD ALERT: 483, 922, 931

760797 ID NO. - E1770860797  
STABILITY OF SLOPES IN VARIATIONAL AND PROBABILISTIC SOLUTIONS.

Biernatowski, K.  
Tech Univ, Wroclaw, Pol  
Eur Conf on Soil Mech and Found Eng, 6th, Proc, Vienna, Austria, Mar 22-24 1976 Sponsored by Int Soc for Soil Mech and Found Eng, London, Engl, 1976 v 1, 1 Pap 1/1-1 p 1-7  
The methods by which the stability of slopes is examined are based on the analysis of state of stresses in soil medium that constitutes the slope considered. Computations are performed by approximation methods in which a definite shape of slip surface is assumed and the equilibrium of forces acting within it is analyzed. The soil solid over the slip surface is treated as a rigid body, consisting either of rigid elements or of cooperating strips. 10 refs.  
DESCRIPTORS: \*SOIL MECHANICS. (STRESSES. Analysis). FOUNDATIONS. PROBABILITY. MATHEMATICAL MODELS.  
IDENTIFIERS: SLOPE STABILITY. APPROXIMATION METHODS  
CARD ALERT: 405, 408, 483, 921, 931

759160 ID NO. - E1770859160  
O STATISTICHESKON METODE UTSENKI MERAZRUSHI MOSTI GORNYKH POROD STENOK ISKRIVLENNOI SKVAZHNIN. sleft brackets  
Statistical Method of Evaluation of the Firmness of Rocks of the Walls of a Deflected Borehole Slight Brackets

Maihev, G. A.; Malachukhanov, I. B.  
Dagestanskiy Polytech Inst, USSR  
17v Vyssh Uchebn Zaved Neft Gaz n 1 1977 p 29-33 CODEN: IUVN24  
A method of statistical approach to the evaluation of the firmness of rocks of the wall-adjacent zone of a deflected oil or gas well is set forth. It takes into account the variability of their physical and mechanical properties and rheological characteristics of the drilling fluid. The solution is based on Rzhnitsin's analytical condition of firmness and on Mises' energetic theory of strength. A calculation formula is obtained permitting determination of the maximum depth of stable condition of rocks forming the walls of a deflected well. 12 refs. In Russian.  
DESCRIPTORS: (\*OIL WELL DRILLING. \*Deflected). ROCK MECHANICS.  
CARD ALERT: 511, 502, 483

746826 ID NO. - E1770746826  
REPRESENTATIVENESS OF PHYSICAL AND MECHANICAL CHARACTERISTICS OF ROCKS SURROUNDING COAL SEAMS, AND METHODS OF ESTIMATING THEM.

Saifirov, B. V.; Bruiko, Yu. P.; Dyuma, A. I.  
Donbass Sci-Res Lab, Rostov-on-Don, USSR  
Sov Min Sci v 12 n 3 May-Jun 1976 p 235-237 CODEN: SMIAS4  
There are practically no specially selected and properly systematized data to make possible a quantitative estimate of even the main sources of error in determination of the

strength properties of the rocks surrounding a coal seam. Results of investigations made and detailed records of the mechanical strength (compressive breaking strength) of a lithologically homogeneous stratum of siltstones which extends over the whole area in the immediate roof of the k/2 seam are analyzed. The variation in the strength values of the siltstone from different boreholes, ranging from 300 to 771 kg/cm<sup>2</sup>, reflects the natural geological variation of the rock within the area investigated as well as results from errors due to the different degrees of crushing of the core during drilling and imperfection of the laboratory investigation methods. In other words, the results of tests on each core sample can be regarded as the sum of three independent random variates SEM DASHS the natural strength of the rock at the point of sampling, \$sigma\_s\$, the error due to the drilling process, \$DELTA\_S\$, //d, and the error of the laboratory tests, \$DELTA\_T\$ //1. By one of fundamental laws of mathematical statistics, the dispersion of the sum of independent terms is equal to the sum of their dispersions. 3 refs.  
DESCRIPTORS: (\*COAL MINES AND MINING. \*Rock Pressure). ROCK MECHANICS. MATHEMATICAL STATISTICS.  
CARD ALERT: 503, 483, 502, 922

737533 ID NO. - E1770637533  
SLOPE STABILITY ANALYSIS AND DESIGN BASED ON PROBABILITY TECHNIQUES AT CASSIAR MINE.

Piteau, Douglas R.; Martin, Dennis C.  
D. R. Piteau & Assoc Ltd, West Vancouver, BC  
CIM Bull v 70 n 779 Mar 1977 p 139-150 CODEN: CIBUBA  
This paper describes the open-pit studies relating to slope stability and design of the argillitic waste rocks which form the upper 700 feet of the 1000- to 1100-ft-high hanging-wall slope at the Cassiar Mine in British Columbia. Analyses indicated that the likelihood of deep-seated failure in terms of slope angles which are geometrically possible was low. However, wedge failures on benches, which involve either whole or parts of the benches, were found to be of principal importance with respect to stability. Slope stability analyses and related slope design were based essentially on evaluating the geometry of the potential wedge failures in terms of the probability of occurrence of unstable wedge failures which could spill over the berms. 5 refs.  
DESCRIPTORS: (\*ASBESTOS MINES AND MINING. \*Open Pit). ROCK MECHANICS.  
CARD ALERT: 505, 483, 502

735724 ID NO.: E1770535724  
PROBABILISTIC ASSESSMENT OF THE STABILITY OF A CUT SLOPE.

Peirce, M. J.  
Minist of Works & Dev. NZ  
NZ Eng v 31 n 10 Oct 15 1976 p 239-241 CODEN: NZENAS  
The primary objective of the paper is to illustrate the calculation procedure while keeping the computational procedure as simple as possible. This end is greatly facilitated by the adoption of a simple model for the mechanics of the slope failure and the distribution of material properties. The profile of the slope analysed is shown. The stability was considered in two stages: first, the full depth of cut was considered with a simplified profile, a simple cut with slope 61 degrees; and, secondly, the possible behavior of the steeper upper part of the slope was considered. 3 refs.  
DESCRIPTORS: (\*SOILS, \*Testing), SOIL MECHANICS, PROBABILITY  
IDENTIFIERS: SLOPE STABILITY, PROBABILISTIC ASSESSMENT, SLOPE FAILURE  
CARD ALERT: 483, 922, 951

735670 ID NO.: E1770535670  
APPLICATION OF RISK ANALYSIS TO PREDICTION OF SLOPE INSTABILITY.

Yong, Raymond N.; Alonso, E.; Fransham, Peter B.; Tabba, M. Myassar  
McGill Univ, Montreal, Que  
Can Geotech Conf, 29th, Vancouver, BC, Oct 13-16 1976  
Sponsored by Can Geotech Soc, Montreal, Que, 1976 Sess XII p 1-24  
The problem of prediction of stability or instability of natural clay slopes is examined in view of the random intrinsic nature of both soil properties and external actions. The probabilistic method of analysis appears to be a useful tool which could account not only for the random properties as shown, but could also consider uncertainties derived from incomplete knowledge of pertinent model parameters and conditions of stability. 15 refs.  
DESCRIPTORS: \*SOIL MECHANICS, MATHEMATICAL MODELS, CLAY, PROBABILITY  
IDENTIFIERS: SLOPE STABILITY, RISK ANALYSIS, PROBABILISTIC METHODS  
CARD ALERT: 483, 921, 922, 931

735665 ID NO.: E1770535665  
SLAB AVALANCHE MEASUREMENTS.

Perla, R.  
Environ Can, Calgary, Alberta  
Can Geotech Conf, 29th, Vancouver, BC, Oct 13-16 1976  
Sponsored by Can Geotech Soc, Montreal, Que, 1976 Sess VII p 1-14  
From a study of 205 slab avalanches it is concluded that failure initiates where the slope is 25 degrees or steeper.

that slab failure stress is in the range  $10^{+2}$  N/m<sup>2</sup> to  $10^{+4}$  N/m<sup>2</sup>, and that the slab failure plane is most commonly at a temperature of minus 5 degrees C or warmer. A statistical analysis of a shear-frame device shows that the device is sensitive to rate-of-pull and to the frame area. 24 refs.  
DESCRIPTORS: \*SOIL MECHANICS, LANDSLIDES, ROCK MECHANICS, (SNOW AND SNOWFALL, Avalanche and Slides),  
IDENTIFIERS: SHEAR STRENGTH  
CARD ALERT: 443, 483, 502, 931

735661 ID NO.: E1770535661  
STANDARD PENETRATION RESISTANCE IN COHESIONLESS SOILS.

Gavad, E. A.  
Suez Canal Auth, Egypt  
Soils Found v 16 n 4 Dec 1976 p 47-60 CODEN: SOIFBE  
An extensive number of penetration tests were performed in a laboratory model. The results obtained were compared with field penetration tests in three sites of different characteristics with a view to obtain a general relationship between various penetration devices which are to be used in evaluating the strength of sandy soils. For laboratory tests various sizes of tanks filled with sands of various grading characteristics and of controlled densities were used. New statistical formulas were derived between various factors which influence soundings in sandy soils. 8 refs.  
DESCRIPTORS: \*SOIL MECHANICS, (SOILS, Permeability), SAND AND GRAVEL, MATHEMATICAL MODELS,  
IDENTIFIERS: PENETRATION RESISTANCE, COHESIONLESS SOILS  
CARD ALERT: 483, 922, 931

735658 ID NO. - E1770535658  
**RISK ANALYSIS OF SLOPES AND ITS APPLICATION TO SLOPES IN  
CANADIAN SENSITIVE CLAYS.**

Alonso, E. F.  
Esc Tec Super de Ing de Caminos, Barcelona, Spain  
Geotechnique v 26 n 3 Sep 1976 p 453-472 CODEN: GTNQAB  
The problem of defining better measures of the safety of  
slopes has been approached from a probabilistic point of view.  
Using a mechanistic description of stability (the method of  
slices), a first order probability analysis was implemented to  
allow for a rational evaluation of the different sources of  
uncertainty involved. A preliminary sensitivity analysis  
shows that the uncertainties in the cohesion parameter, the  
pore-pressure and the method of analysis are the relevant ones  
in governing the resulting uncertainty in the slope safety. A  
relationship between mean safety factor and probability of  
failure is developed for the conditions likely to prevail in  
Champain Sea deposits. 33 refs.  
DESCRIPTORS: \*SOIL MECHANICS, (GEOPHYSICS, Rock Properties),  
CLAY, PROBABILITY, (SOILS, Pore Pressure).  
IDENTIFIERS: SLOPE STABILITY, SLOPE PROTECTION  
CARD ALERT: 481, 483, 922, 931

735541 ID NO. - E1770535541  
**PREDICTABILITY OF VOLUME CHANGES OF SHALES.**  
Annamalai, Manickam; Laguros, Joakim G.; Kumar, Subodh  
Istanbul Conf on Soil Mech and Found Eng, Turk, Mar 31-Apr 4  
1975 Sponsored by Istanbul Tek Univ, Turk, 1975 v 1 p 197-203  
For experimental verification, four shales were selected to  
represent variations in texture and clay mineralogy, and were  
subjected to ultrasonic disaggregation. Using the statistical  
relationships, the volume changes of the ultrasonic treated  
shales were predicted in terms of their index properties and  
found to compare favorably with the corresponding volume  
changes measured experimentally. 5 refs.  
DESCRIPTORS: \*SHALE, (SOILS, Testing), SOIL MECHANICS,  
STATISTICAL METHODS.  
CARD ALERT: 482, 483, 922, 931

731828 ID NO. - E1770531828  
**BIAXIAL SLIP OF A MASS ON A FOUNDATION SUBJECTED TO  
EARTHQUAKE MOTIONS.**

Crandall, Stephen H.; Lee, Samson S.  
MIT, Cambridge, Mass  
Ing Arch v 45 n 5-6 1976 p 361-370 CODEN: INARAS  
The relative motion of a rigid mass on a horizontal  
foundation undergoing biaxial random motion in the horizontal  
plane is studied under the assumption that Coulomb friction  
acts between the mass and the foundation. The displacement of  
the mass with respect to the foundation is a two-dimensional  
random walk whose statistical parameter depend nonlinearly on  
the intensity and correlation of the biaxial excitation.  
Analytical results are obtained via the Fokker-Planck equation  
and the Equivalent Linearization procedure and simulation

results are obtained via the digital computer. These results  
may be useful for predicting the accumulated slip of a stiff  
compact structure free to slide on its foundation during an  
earthquake.

DESCRIPTORS: (\*FOUNDATIONS, \*Earthquake Resistance), (SOIL  
MECHANICS, Earthquake Resistance), (LANDSLIDES, Monitoring).  
CARD ALERT: 405, 483, 484, 931

731827 ID NO. - E1770531827  
**PROBABILISTIC APPROACH TO FOUNDATION DESIGN.**

Stodiqul, Javed Tahir; Niyogi, P. K.; Hon Hsieh, Su  
Murray-McCormick Environ Group, Atlanta, Ga  
Istanbul Conf on Soil Mech and Found Eng, Turk, Mar 31-Apr 4  
1975 Sponsored by Istanbul Tek Univ, Turk, 1975 v 2 p 85-97  
A simplified procedure has been formulated which is reported  
to allow a considerable simplification over the conventional  
design methods and also provides direct information on safety  
of the structure. Different probabilistic distribution models  
are chosen to represent the variation in shear strength data  
and the applied loads and a method is presented to determine  
the design value of bearing capacity of the underlying soil at  
any particular chosen level of reliability. Design charts  
have been developed for deterministic loadings and soils  
strength having Gaussian or Lognormal distribution. 12 refs.  
DESCRIPTORS: (\*FOUNDATIONS, \*Design), SOIL MECHANICS,  
PROBABILITY, MATHEMATICAL MODELS.  
IDENTIFIERS: SHEAR STRENGTH  
CARD ALERT: 405, 483, 921, 922, 931

728274 ID NO. - E1770428274  
COMPARISON OF BEDROCK AND SURFACE SEISMIC INPUT FOR NUCLEAR POWER PLANTS.

Zaslavsky, Maurice; Wright, Lawrence H.  
Univ of Calif, Lawrence Livermore Lab  
Pap Presented and Discussed at the Int Conf on Numer Methods in Geomech, 2nd, Va Polytech Inst and State Univ, Blacksburg, Jun 1976 Publ by ASCE, New York, NY, 1976 v 2 p 991-1000  
It is current practice in the nuclear industry and elsewhere to specify the seismic input to design calculations at the surface of the site, rather than at bedrock. Further, the need for detailed site analyses to define this seismic input are often eliminated by the use of statistically derived seismic input whose inherent conservatism renders them applicable to a variety of sites. The paper reports an investigation into some of the implications of these methods through an extensive parametric survey by comparing the site response between a surface specification of seismic input and a bedrock specification. The survey considered six typical sites consisting of the soil profiles with average shear wave velocities of 800, 1800, and 5000 fps, and two soil depths of 200 and 400 feet. Seismic input to these sites were then synthetic accelerograms. The response of each site was then calculated in two ways with the program SHAKE.  
DESCRIPTORS: (\*STRUCTURAL ANALYSIS, \*Earthquake Resistance), SOIL MECHANICS, ROCK MECHANICS, NUCLEAR POWER PLANTS, COMPUTER SIMULATION.  
CARD ALERT: 931, 483, 723

727699 ID NO. - E177042699  
STATISTICAL VARIATION OF THE COMPLIANCE OF COAL.

Atkinson, Richard Henry; Ko, Hon-Yim  
Atkinson-Noland & Assoc, Boulder, Colo  
Pap Presented and Discussed at the Int Conf on Numer Methods in Geomech, 2nd, Va Polytech Inst and State Univ, Blacksburg, Jun 1976 Publ by ASCE, New York, NY, 1976 v 1 p 367-380  
The constitutive relations of a commercial Illinois coal were determined in the laboratory. A multiaxial test cell was used to apply an arbitrary compressive principal stress state to a cubical specimen of the coal and the resulting strains were determined. The compliances thus determined show considerable scatter which might be expected for a material containing numerous bedding and cleat cracks. The data were thus subjected to statistical analysis to define the nature of the distribution of values and the numerical parameters of the distribution. The results of this study are expressed in terms of compliance matrices for an orthotropic material. 11 refs.  
DESCRIPTORS: (\*COAL, \*Mechanical Properties), MATHEMATICAL STATISTICS, ROCK MECHANICS.  
IDENTIFIERS: CONSTITUTIVE RELATIONS, COMPLIANCE MATRICES  
CARD ALERT: 524, 922, 483

SAFETY OF SEISMIC PROTECTIVE SYSTEMS WITH RESERVE ELEMENTS.

Eisenberg, I. M.  
TSNIISK Kutsheleiko, Moscow, USSR  
Proc of the Int Symp on Earthquake Struct Eng, St Louis, Mo, Aug 19-21 1976 Publ by Univ of Mo, Dep of Civ Eng, Rolla, 1976 v 2 p 927-943

Some results of the approximate analysis of safety of earthquake protective systems with reserve disengaging elements are presented. Systems with one and several reserve elements are considered. The overshoot random vibration approximation SEM DASH<sub>2</sub> a white noise process is assumed as a mathematical model of earthquake ground motion. A numerical example is given. It is shown that the failure probability of reserve elements structures is considerably lower, and the safety is much higher compared with such characteristics of structures without reserve elements. 22 refs.

DESCRIPTORS: (\*BUILDINGS, \*Earthquake Resistance), (\*STRUCTURAL ANALYSIS, Failure), VIBRATIONS, (\*SOIL MECHANICS, Mathematical Models).  
IDENTIFIERS: STRUCTURAL FRAMES  
CARD ALERT: 402, 484, 931, 483

705583 ID NO. - E1770105583  
RECENT DEVELOPMENTS IN THE INTERPRETATION OF DATA FROM JOINT SURVEYS IN ROCK MASSES.

Steffen, O. K. H.; Kerrich, J. E.; Jennings, J. E.  
Steffen, Robertson & Kirsten, Johannesburg, S Afr  
Proc of the Reg Conf for Afr, 6th: Soil Mech and Found Eng, Durban, S Afr, Sep 1975 Publ for S Afr Inst of Civ Eng, Div of Soil Mech and Found Eng by A. A. Balkema, Cape Town, S Afr, 1975 v 2 p 17-26

The paper defines some of the problems encountered during the evaluation of stability of rock slopes in large opencast mines and describes some statistical techniques used for the data interpretation. The definition of the boundaries to joint sets and estimation of lengths of joints and their spacing are dealt with in particular. The influence of instrumentation and observer errors were evaluated in a laboratory and field experiment. The conclusion is reached that considerably greater confidence can be placed on estimation of joint lengths and spacings when using statistical theory but that the definition of joint set boundaries are best obtained from a careful and subjective assessment of the data. 10 refs.

DESCRIPTORS: \*ROCK MECHANICS, MATHEMATICAL STATISTICS, MATERIALS TESTING.  
IDENTIFIERS: ROCK SLOPES, SLOPE STABILITY, ROCK MASSES, JOINTS AND FRACTURES  
CARD ALERT: 483, 922

685102 ID NO. E1761285102  
APPLICATIONS OF STATISTICS AND PROBABILITY IN SOIL AND  
STRUCTURAL ENGINEERING, 2ND INTERNATIONAL CONFERENCE,  
PROCEEDINGS, 1975.

Schulze, Edgar (Ed.)  
Tech Hochschule, Aachen, Ger  
Appl of Stat and Probab in Soil and Struct Eng, 2nd Int  
Conf. Proc. Pap. Aachen, Ger, Sep 15-18 1975 Publ by Dtsch Ges  
fuor Erd-und Grundbau, Essen, Ger, 1975, 3 v, 1266 p  
The Proceedings contain 53 papers presented at the  
conference, as well as general reports, discussions of the  
various sessions and papers, and a list of participants.  
Among the topics covered in the papers are probabilistic limit  
analysis and design of structures and earthworks, reliability  
estimates of structural systems, failure probability analysis,  
seismic risk evaluation, applications in bridge, foundation,  
dam, highway and slope design and analysis, stochastic  
formulation of soil properties, soil sampling and test data  
analyses and others. Selected papers are indexed separately.  
DESCRIPTORS: (\*STRUCTURAL ANALYSIS, \*Mathematical Models),  
SOIL MECHANICS, MATHEMATICAL STATISTICS, PROBABILITY,  
STRUCTURAL DESIGN, RELIABILITY,  
IDENTIFIERS: STOCHASTIC ANALYSIS, RISK ANALYSIS, STABILITY  
ANALYSIS, SOIL-STRUCTURE INTERACTION  
CARD ALERT: 931, 922, 483, 408, 921

684731 ID NO. E1761284731  
STATISTICAL EVALUATION OF SOILS TEST DATA SEM DASHES 2.  
FACTOR ANALYSIS.

Holtz, Robert D.; Schroder, Janet E.  
Purdue Univ, West Lafayette, Indiana  
Appl of Stat and Probab in Soil and Struct Eng, 2nd Int  
Conf. Proc. Aachen, Ger, Sep 15-18 1975 v 2 p 339-364. Publ  
by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger, 1975  
An advanced multivariate statistical analysis technique  
called factor analysis was applied to twenty sets of  
laboratory and field data, which were previously analyzed by  
multiple linear regression procedures. The technique, which  
has not been used in soils engineering, enables the  
description of complex multi-variable data in terms of eight  
double quotes factors eight double quotes, which are  
hypothetical statistical constructs and which maximally  
reproduce the linear correlations among the variables. The  
paper illustrates the feasibility of the method and how the  
output of standard factor analysis computer programs is used  
to determine the engineering significance and validity of the  
computed factors and the association among the observed  
variables.  
DESCRIPTORS: (\*SOILS, \*Testing), MATHEMATICAL STATISTICS, (  
SOIL MECHANICS, Computer Applications),  
IDENTIFIERS: FACTOR ANALYSIS, MULTIVARIATE STATISTICAL  
ANALYSIS  
CARD ALERT: 483, 922, 723

684704 ID NO. E1761284704  
BAYESIAN DESIGN OF OPTIMAL EXPERIMENTS FOR THE ESTIMATION OF  
SOIL PROPERTIES.

Veneziano, Daniele; Faccolini, Ezio  
MIT, Cambridge, Mass  
Appl of Stat and Probab in Soil and Struct Eng, 2nd Int  
Conf. Proc. Aachen, Ger, Sep 15-18 1975 v 2 p 191-213. Publ  
by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger, 1975  
A Bayesian approach to the design of sampling networks for  
soil profile estimation is presented. The study proposes a  
rational guide to the design of boring networks for  
determining the depth of hard ground, or to any other soil  
layer of interest, over extended areas. Large-scale trends,  
rather than local variations, are supposed to be of primary  
interest although the model proposed has no such intrinsic  
restriction. The approach can be used in any exploration  
problem where the unknown soil property is a function of one  
or more spatial coordinates (soil strength, penetration  
resistance, water content, etc.). Refs.  
DESCRIPTORS: (\*SOILS, \*Sampling), MATHEMATICAL STATISTICS, (  
SOIL MECHANICS, Mathematical Models),  
CARD ALERT: 483, 913, 922

684647 ID NO. E1761284647  
VARIATIONAL INEQUALITY APPROACH TO THE STOCHASTIC FRICTION  
BOUNDARY VALUE PROBLEM AND APPLICATION IN SOIL MECHANICS.

Panagiotopoulos, P. D.  
Tech Hochschule, Aachen, Ger  
Appl of Stat and Probab in Soil and Struct Eng, 2nd Int  
Conf. Proc. Aachen, Ger, Sep 15-18 1975 v 3 p 221-230. Publ  
by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger, 1975  
The paper presents a finite element formulation of the  
friction boundary value problem of a material with  
nonquadratic deformation energy. With the formulation, more  
general boundary conditions than those permitted in other  
analyses may be included. The deterministic mathematical  
model combined with a modified Monte Carlo algorithm gives the  
solution of stochastic friction boundary value problems. The  
theory is illustrated by means of an example taken from soil  
mechanics. 10 refs.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Mathematical Models),  
MATHEMATICAL STATISTICS, (MATHEMATICAL TECHNIQUES, Finite  
Element Method), FRICTION BOUNDARY VALUE, STOCHASTIC  
ANALYSIS,  
CARD ALERT: 482, 922, 921

**684645 ID NO. - E1761284645  
METHOD FOR THE APPLICATION OF SOIL MECHANICS TO  
NON-HOMOGENEOUS SOILS.**

McAnally, P. A.  
Ground Test Ltd, Aust  
Natl Conf Publ Inst Eng Aust n 75/4: Aust-NZ Conf on  
Geomech, 2nd, Brisbane, Jul 21-25 1975 p 26-30 CODEN: MPIEDX  
A statistically based model is developed to overcome the  
uncertainties in the selection of design parameters for soils  
arising from their non-homogeneity. Experimental verification  
of this model is presented. It is shown that conventional  
methods of selection of design parameters lead to an  
indefinite situation with respect to factor of safety. A  
method for the selection of design parameters and factor of  
safety is proposed, based on ensuring an acceptable  
probability of satisfactory performance. 12 refs.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Mathematical Models), SOILS,  
FOUNDATIONS.  
IDENTIFIERS: NON-HOMOGENEOUS SOILS, DESIGN PARAMETERS  
CARD ALERT: 483, 922

**684641 ID NO. - E1761284641  
APPLICABILITY OF REGRESSION ANALYSIS IN SOIL MECHANICS WITH  
THE HELP OF DATA-BANKS.**

Rizkallah, Victor; El Nimir, Ahmed  
Tech Univ, Hannover, Ger  
Appl of Stat and Probab in Soil and Struct Eng, 2nd Int  
Conf, Proc, Aachen, Ger, Sep 15-18 1975 v 2 p 423-438. Publ  
by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger, 1975  
Statistical estimates for several soil parameters are  
determined. The results are generally obtained in polynomial  
forms of high orders, and they are prepared in complete sets  
of tables within the ranges of tested samples. The collected  
data are tested in laboratory and gathered in a data bank.  
Some of these results were tested through regression analyses  
with the aim of estimating some properties of a spacial soil  
namely the soft clayey sea silt. The comparison with measured  
results indicated the fairly good accuracy of the statistical  
estimation.  
DESCRIPTORS: (\*SOIL MECHANICS, \*Computer Applications),  
MATHEMATICAL STATISTICS,  
IDENTIFIERS: REGRESSION ANALYSIS  
CARD ALERT: 483, 723, 922

**684231 ID NO. - E1761284231  
ANALYSIS OF SIZE EFFECT BEHAVIOUR IN BRITTLE ROCK.**

Brown, E. T.; Gonano, L. P.  
James Cook Univ of North Queensland, Aust  
Natl Conf Publ Inst Eng Aust n 75/4: Aust-NZ Conf of  
Geomech, 2nd, Brisbane, Jul 21-25 1975 p 139-143 CODEN:  
MPIEDX  
Statistical and empirical methods of describing the  
frequently observed size-strength dependency in rock are  
unsatisfactory. An analysis of the energetics of fracture

shows that the critical energy level required for crack  
propagation may vary with initial crack or discontinuity size,  
mode of fracture, and homogeneity of the stress distribution.  
Each of these factors can produce size effects. The results  
of punch bearing tests verify a theoretical conclusion that  
stress gradients can introduce apparent size effects. 24  
refs.

DESCRIPTORS: (\*ROCK MECHANICS, \*Stresses), (GEOPHYSICS, Rock  
Properties).  
IDENTIFIERS: FRACTURE, CRACK PROPAGATION, STRESS GRADIENTS  
CARD ALERT: 483, 481, 502

**684225 ID NO. - E1761284225  
SOME FIELD PERMEATION PROPERTIES OF FRACTURED PERMIAN AND  
TRIASSIC SANDSTONES IN NORTHWEST ENGLAND.**

Cronk, J. M.; Howell, F. T.  
Warrington New Town Dev Corp, Engl  
ASME Pap n 76-Pet-43 for Meet Sep 19-24 1976, 5 p CODEN:  
ASMSA4

The 1000-m thick series of Permian and Triassic sandstones  
in Northwest England exhibit both intergranular and fissure  
flow. However, estimates of their relative importance can be  
distorted by the statistical manipulation of test data.  
Additional parameters which are believed to independently  
identify the mechanism of flow are examined. These include  
variation of field permeability in 171 boreholes with respect  
to depth and radius of the pumped bore, distance from tectonic  
zones and consideration of the regional distribution of fluid  
bodies. Interpretation suggests that intergranular flow is  
dominant despite the fractured nature of the rock mass. 16  
refs.

DESCRIPTORS: (\*ROCK MECHANICS, \*Stresses), (BOREHOLES,  
Exploratory), (GEOPHYSICS, Rock Properties).  
CARD ALERT: 483, 501, 481, 502

684223 ID NO. E1761284223  
PRESENTATION OF FRACTURE DATA FOR ROCK MECHANICS.

Bridges, M. C.  
Mount Isa Mines Ltd  
Natl Conf Publ Inst Eng Aust n 75/4: Aust NZ Conf of Geomech, 2nd, Brisbane, Jul 21-25 1975 p 144 148 CUIJF: MPIEDX

Fractures are sampled along straight lines within a rock domain, divided into fractures sets, and the data in each set then further divided into categories of orientation, spacing, continuity, waviness, apertures and spatial distribution. Data in each of these categories fits a particular mathematical statistical model and the best estimates of the model's population parameters can be obtained from the samples and presented in simple tables and diagrams. This presentation contains all the necessary data on the fracture pattern and can be readily understood and used by those who are applying the data for rock mechanics. 22 refs.

DESCRIPTORS: (\*ROCK MECHANICS, \*Sampling), (GEOPHYSICS, Rock Properties), FRACTURE PATTERNS, CLASSIFICATION  
IDENTIFIERS: FRACTURE, FRACTURE PATTERNS, CLASSIFICATION  
CARD ALERT: 483, 481, 922, 502

684220 ID NO. E1761284220  
PROBABILITY OF FAILURE AND EXPECTED VOLUME OF FAILURE IN HIGH ROCK SLOPES.

McMahon, B. K.  
Aust Rock Eng Consult  
Natl Conf Publ Inst Eng Aust n 75/4: Conf of Geomech, 2nd, Brisbane, Jul 21-25 1975 - 308-313 CODEN: NPIEDX  
Long high rock slopes such as those obtained in large open pit mines are excavated in a series of lifts. Slope failures can occur by sliding along fractures, or combinations of fractures, at any stage in the slopes' history. Procedures for calculating the probability of 'left double quotes operational failures' (right double quotes, defined as failures above a certain size, and the expected volumes of such failures are presented). Procedures are also given for calculating the percentage of the area of a major slope affected by operational failures of berms reduced to a width less than that required by operational practice or government regulation. In projects where significant risk of failures can be accepted, the optimum slope is the one where the present value of the costs of initial excavation plus the expected costs resulting from failures are a minimum.

DESCRIPTORS: (\*ROCK MECHANICS, \*Failure), EXCAVATION, (MINES AND MINING, Open Pit),  
IDENTIFIERS: SLOPE STABILITY, FRACTURING  
CARD ALERT: 483, 421, 405, 502

Appl of Stat and Probab in Soil and Struct Eng, 2nd Int Conf, Proc, Aachen, Ger, Sep 15-18 1975 v 2 p 387-396. Publ by Dtsch Ges fuer Erd- und Grundbau, Essen, Ger, 1975

The paper discusses such design for an anchored sheet pile wall using the free earth support method. For engineering design purposes, average values of the soil properties and layer thickness of multilayer site are assumed and the critical depth for a unit factor of safety is computed. Assuming that the variation of the soil properties varies according to log normal distributions, values of the soil properties are generated using Monte Carlo techniques for given values of the coefficient of variation and median values of the soil parameters. These soil properties are then used to compute the anchored sheet pile wall design depth, which is compared with the critical depth. Refs.

DESCRIPTORS: (\*RETAINING WALLS, \*Design), PROBABILITY, SOIL MECHANICS, PILES, FOUNDATIONS,  
IDENTIFIERS: SHEET PILE WALLS  
CARD ALERT: 405, 922, 483, 408

683524 ID NO. E1761283524  
PROBABILISTIC LIMIT ANALYSIS OF PLATES ON PLASTIC SUBGRADE.

Dolinski, K.; Sawczuk, A.  
Inst of Fund Technol Res, Warsaw, Pol  
Conf, Proc, Aachen, Ger, Sep 15-18 1975 v 3 p 185-205. Publ by Dtsch Ges fuer Erd- und Grundbau, Essen, Ger, 1975

Load carrying capacity of plates supported by plastic foundation is considered within the random functions theory. In the probabilistic approach the load carrying capacity is specified by a load multiplier which is a random variable. The question of applying kinematically admissible load multipliers is discussed with respect to structures with a stochastic yield condition and subjected to random loading fields. The theorem is applied to assess the probability of collapse loads for circular plates resting on plastic subgrade. The yield point of the subgrade is described either by a random series or by a random function. Plastic properties of the plate are described by a random yield moment. 13 refs.

DESCRIPTORS: (\*PLATES, \*Foundations), (SOIL MECHANICS, Mathematical Models), PROBABILITY,  
IDENTIFIERS: LIMIT ANALYSIS  
CARD ALERT: 408, 931, 483, 922

684168 ID NO. E1761284168  
DESIGN OF SHEET PILE WALLS USING PROBABILISTIC METHODS.

Kovacs, William O.; Yao, James T. P.  
Purdue Univ, West Lafayette, Indiana

683471 ID NO. - E1761283471  
**EXTREMUM AND VARIATIONAL PRINCIPLES IN PLASTICITY.**

Lippmann, H.  
Rozpr Inz v 23 n 3 1975 p 393-421 CODEN: RZINAZ  
Extrem of functions (functionals)  $\Psi$  for numerical reasons are frequently expressed in the weaker variational form  $\delta \Psi \leq 0$ . The relationship between the two forms is discussed. The variational and extremum principles for rigid plastic materials are considered. The classical dual theorem of Karman-Sadowski-Phillips-Hill upper and lower bound principles are given in a general form which is not restricted to specific boundary conditions, or to incompressibility, rate-independence, homogeneity, or isotropy. They are illustrated by a series of examples taken from structural mechanics, metal forming technology and soil mechanics to show some recently studied features concerning surface friction, action of volume forces, and volume compression, or extension, respectively. Static problems for elastic-plastic material are covered and rate-dependent or dynamic plasticity is discussed. 118 refs.  
DESCRIPTORS: \*PLASTICITY. (MATRIALS TESTING, Creep).  
STATISTICAL METHODS. MECHANICS.  
CARD ALERT: 931, 922, 421

consolidation settlements is introduced in a case study performed at two flood protection levee test sections in the East Atcharalaya Basin, Louisiana. The large differences in measured settlement values are explained by a probabilistic settlement prediction model which accounts for the variability in initial effective stresses, stress increments and compression ratios. Critical parameters in the model are identified and the role of engineering judgement in the use of the model is emphasized.

DESCRIPTORS: \*LEVEES. (SOILS, Consolidation). PROBABILITY. (SOIL MECHANICS, Mathematical Models).  
IDENTIFIERS: CONSOLIDATION SETTLEMENT  
CARD ALERT: 442, 483, 922

681184 ID NO. - E1761281184  
**INFLUENCE OF VOID DISTRIBUTION AND ENTROPY ON THE ENGINEERING PROPERTIES OF GRANULAR MEDIA.**

Jowitz, P. W.; Munro, J.  
Imp Coll of Sci & Technol, London, Engl  
Appl of Stat and Probab in Soil and Struct Eng. 2nd Int Conf, Proc, Aachen, Ger, Sep 15-18 1975 v 2 p 365-385. Publ by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger, 1975  
A review of work concerned with the microstructure and behavior of granular media is presented, and the need for a probabilistic approach to the study of granular media is emphasized. Information theory is used as a fundamental concept to explore the statistical aspects of a granular material. The connection between information theory and thermodynamic entropy allows inferences to be drawn on the significance of the critical void ratio, and comparisons to be made with existing experimental results. Refs.  
DESCRIPTORS: (\*GRANULAR MATERIALS, \*Analysis). PROBABILITY. SOIL MECHANICS. THERMODYNAMICS. INFORMATION THEORY.  
IDENTIFIERS: MICROSTRUCTURE  
CARD ALERT: 483, 922, 641

681836 ID NO. - E1761281836  
**ON THE RELIABILITY OF FLOOD LEVEE SYSTEMS.**

Bogardi, Istvan; Duckstein, Lucien; Szidarovszky, Ferenc  
Water Resour Cent, Budapest, Hung  
Appl of Stat and Probab in Soil and Struct Eng, 2nd Int Conf, Proc, Aachen, Ger, Sep 15-18 1975 v 1 p 47-66. Publ by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger, 1975  
The paper discusses how the reliability of a flood levee reach can be investigated by considering the reach to be a soil structure system. The method permits estimation of the system reliability of levee reaches with due allowance to the following factors: the stochastic character of flood loads when there are two nonindependent stochastic loads; the various failure modes; the uncertain resistances of subreaches against the various failure modes, even if there is a spatial dependence between the resistances of subsequent subreaches; the uncertainties caused by parameter estimation due to finite sample sizes. Refs.  
DESCRIPTORS: (\*LEVEES, \*Reliability). SOIL MECHANICS. MATHEMATICAL STATISTICS.  
CARD ALERT: 442, 913, 483, 922

681835 ID NO. - E1761281835  
**PROBABILISTIC PREDICTION OF LEVEE SETTLEMENTS.**

Vanmarcke, Erik H.; Fuleihan, Nadim F.  
MIT, Cambridge, Mass  
Appl of Stat and Probab in Soil and Struct Eng, 2nd Int Conf, Proc, Aachen, Ger, Sep 15 18 1975 v 2 p 175-190. Publ by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger, 1975  
A probabilistic approach to the determination of

681114 ID NO. EI761291114  
**THEORETICAL AND PRACTICAL ASPECTS OF LAND STABILITY**  
Shirley, A. F.

Andrew Shirley & Assoc Ltd  
Natl Conf Publ Inst Eng Aust n 75/4 Aust-NZ Conf of  
Geomech. 2nd. Brisbane, Jul 21-25 1975 p 303-307 CODEN  
NP1EDX

The relevance and accuracy of various theoretical concepts and practical procedures adopted in the assessment of the stability of land is discussed to enable the understanding of a probability approach to stability assessment. The necessity for the detailed understanding of the site geological and environmental processes is emphasized, and guidelines are offered on methods of data collection, land stability assessments, and subdivisional planning. The two-stage classification system outlined in the paper requires careful field observations and thorough understanding of the various theoretical approaches to soil behavior. Land Stability Classification systems are suggested for both left double quotes Regional Right double quotes and left double quotes Specific Project Right double quotes type of assessments. 14 refs.

DESCRIPTORS: (\*GEOLOGY, \*TECTONICS), (URBAN PLANNING, Land Use), EARTHQUAKES, LANDSLIDES, SUBSIDENCE, SOIL MECHANICS, IDENTIFIERS: LAND STABILITY, CLASSIFICATION SYSTEMS  
CARD ALERT: 481, 403, 484, 483

680952 ID NO. EI761280952  
**RAFT FOUNDATIONS SEM DASHES CASE STUDY AND SENSITIVITY ANALYSIS.**

Fraser, R. A.; Wardle, L. J.  
CSIRO, Melbourne, Aust  
Appl of Stat and Probab in Soil and Struct Eng. 2nd Int Conf. Proc. Aachen, Ger, Sep 15 18 1975 v 2 p 89-117. Publ by Dtsch fuer Erd- und Grundbau, Essen, Ger, 1975  
Three multi-story office buildings founded on raft foundations have been studied. Observations were made of settlements, contact pressures, column loads, porewater pressures and settlements at depth beneath the raft foundation. A computer program has been written for the design of raft foundations; the soil-raft interaction behavior being modelled by a loaded plate on a layered cross-anisotropic elastic soil system. A first order probabilistic analysis is conducted to indicate the important parameters needed in design. For the three case studies the actual performance is compared with the predicted performance. Refs.

DESCRIPTORS: (\*FOUNDATIONS, \*Structural Analysis), SOIL MECHANICS, PROBABILITY, (STRUCTURAL DESIGN, Computer Applications), IDENTIFIERS: RAFT FOUNDATIONS, SOIL-STRUCTURE INTERACTION  
CARD ALERT: 405, 931, 483, 922

681947 ID NO. EI761280947  
**STATISTICAL OPTIMIZATION OF FRICTION PILE FOUNDATIONS.**

Wagner, Sidney P.; Krizek, Raymond J.  
Soil & Water Eng Inc, Grand Rapids, Mich  
Appl of Stat and Probab in Soil and Struct Eng. 2nd Int Conf. Proc. Aachen, Ger, Sep 15-18 1975 v 2 p 523-544. Publ by Dtsch Ges fuer Erd- und Grundbau, Essen, Ger, 1975

The paper describes methods whereby probability and decision theory can be used to optimize the cost of friction pile foundations in soft cohesive soils. Appropriate probability distributions, substantiated insofar as possible by available data, are employed in conjunction with conventional deterministic relationships to compute the pile length required for a given group configuration, and a cumulative probability distribution for pile length is obtained by use of the Monte Carlo technique. The foundation costs is minimized on the basis of a cost equation involving the cost per unit length of in-place, cost of the pile cap, and cost associated with the probability of a foundation failure. The effects of variations in the approximations for individual parameters are evaluated. Refs.

DESCRIPTORS: (\*FOUNDATIONS, \*Piles), (STRUCTURAL DESIGN, Optimization), SOIL MECHANICS, PROBABILITY, IDENTIFIERS: FRICTION PILES  
CARD ALERT: 405, 408, 922, 483

680928 ID NO. EI761280928  
**STOCHASTIC CALCULATION OF FOUNDATIONS WITH ELASTIC UNILATERAL AND FRICTION BOUNDARY CONDITIONS.**

Panagiotopoulos, P. D.  
Tech Hochschule, Aachen, Ger  
Appl of Stat and Probab in Soil and Struct Eng. 2nd Int Conf. Proc. Aachen, Ger, Sep 15-18 1975 v 3 p 231-244. Publ by Dtsch Ges fuer Erd- und Grundbau, Essen, Ger, 1975

The paper develops a theory for calculating movements between a foundation and the supporting soil which takes friction into account. The approach considers the influence exerted on the problem by the stochastic character of the soil, the structure and the loads. For this reason the deterministic mathematical model is combined with a Monte Carlo left double quotes pseudo-random generator Right double quotes. A new boundary value problem of elasticity is formulated by combining the friction boundary conditions with the elastic unilateral boundary conditions. Friction and elastic unilateral boundary conditions are considered coupled for the analysis. 13 refs.

DESCRIPTORS: (\*FOUNDATIONS, MATHEMATICAL STATISTICS, (SOIL MECHANICS, Friction), IDENTIFIERS: SOIL-STRUCTURE INTERACTION, STOCHASTIC ANALYSIS  
CARD ALERT: 483, 405, 922, 931

example of slope design is presented to illustrate the proposed risk-based design method. Refs.  
 DESCRIPTORS: (\*EMBANKMENTS, \*Design), PROBABILITY, SOIL MECHANICS.  
 IDENTIFIERS: SOIL SLOPES, SLOPE STABILITY  
 CARD ALERT: 405, 483, 922

680635 ID NO - E1761280635  
**UNCERTAINTIES AND DECISION IN DESIGN OF EMBANKMENT.**  
 Matsuo, Masaru, Kurada, Katsuhiko; Asakava, Akira  
 Nagoya Univ, Jap  
 Appl of Stat and Probab in Soil and Struct Eng, 2nd Int Conf, Proc, Aachen, Ger, Sep 15-18 1975 v 2 143-153. Publ by Dtsch Ges Erd-und Grundbau, Essen, Ger, 1975  
 The paper discusses an optimum procedure for design of an embankment where there are uncertainties with regard to a stability problem. It investigates the reliability of the traditional safety factor method. The question of the probability of embankment failure due to sliding is treated first and then the transition process of increasing strength due to consolidation and the formulation design as a decision problem are discussed with numerical examples. Refs.  
 DESCRIPTORS: (\*EMBANKMENTS, \*Structural Analysis), STRUCTURAL DESIGN, SOIL MECHANICS.  
 IDENTIFIERS: STABILITY ANALYSIS  
 CARD ALERT: 405, 483, 931, 408

680634 ID NO - E1761280634  
**STOCHASTIC PROPAGATION OF RUPTURE SURFACES WITHIN SLOPES.**  
 Athanasiou-Grivas, Dimitrios; Harr, Milton, E.  
 Purdue Univ, West Lafayette, Indiana  
 Appl of Stat and Probab in Soil and Struct Eng, 2nd Int Conf, Proc, Aachen, Ger, Sep 15-18 1975 v 1 p 33-53. Publ by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger, 1975  
 The paper describes a mechanism which models the rupture propagation in a soil embankment and analyzes the related parameters. The material comprising the structure of the slope is considered to be discrete rather than a continuum. Rupture is treated as the locus of voids travelling through the medium under the influence of an induced energy field. Since such a process is stationary, time averages can be replaced by space averages acknowledging the ergodic nature of the system. The force distribution along any vertical section is found to be given by a Pearson type I curve. 29 refs.  
 DESCRIPTORS: (\*EMBANKMENTS, \*Structural Analysis), MATHEMATICAL STATISTICS, SOIL MECHANICS.  
 IDENTIFIERS: STOCHASTIC ANALYSIS, SLOPE STABILITY  
 CARD ALERT: 405, 483, 931, 922

680630 ID NO - E1761280630  
**PROBABILITY-BASED SHORT TERM DESIGN OF SOIL SLOPES.**  
 Tang, W H; Yucemen, M S; Ang, A H S.  
 Univ of Ill at Urbana Champaign  
 Can Geotech J v 13 n 3 Aug 1976 p 201-215. CODEN: CGUOAH  
 The uncertainties involved in the short term stability of soil slopes have been evaluated from an extensive literature survey. A procedure for developing design of earth slopes based on a permissible risk is formulated whereby experience, published research results, experimental test data and judgement can be consistently incorporated in the evaluation of uncertainties and reliability of a given design. An

680340 ID NO - E1761280340  
**APPLICATIONS OF FIRST-ORDER UNCERTAINTY ANALYSIS IN THE FINITE ELEMENTS METHOD IN LINEAR ELASTICITY.**  
 Cambou, Bernard  
 Inst de Ing UNAM, Mexico City, Mex  
 Appl of Stat and Probab in Soil and Struct Eng, 2nd Int Conf, Proc, Aachen, Ger, Sep 15-18 1975 v 1 p 67-87. Puby by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger, 1975  
 The paper describes a method which permits an approximate estimation of uncertainty in the results of a linear elasticity calculus. It is based upon the estimation of the uncertainties which affect the various parameters introduced into the calculus. This method appears to be particularly useful for three kinds of studies: For every problem which can be solved by the finite elements method in linear elasticity, the program permits an evaluation of the sensitivity of the analysis results according to the various parameters introduced into the calculus. Where experimental results exist, the method enables a judgement of whether the differences between the calculus and experimental results can be explained by errors in the data. In statistical studies of soil properties in large constructions, the method can give an idea of the size of the confidence intervals of the displacements and stresses corresponding to a given probability.  
 DESCRIPTORS: \*ELASTICITY, PROBABILITY, SOIL MECHANICS, ROCK MECHANICS, (MATHEMATICAL TECHNIQUES, Finite Element Method).  
 IDENTIFIERS: LINEAR ELASTICITY  
 CARD ALERT: 931, 922, 483, 921

690172 ID NO. E1761280172

**INFLUENCE OF THE VARIABILITY OF COARSE GRAINED MATERIALS PROPERTIES ON THE STABILITY OF EARTH DAMS.**

Evangelista, Aldo; Pellegrino, Arturo; Viggiani, Carlo  
Univ of Napoli, Italy

Appl of Stat and Probab in Soil and Struct Eng. 2nd Int Conf. Proc. Aachen, Ger. Sep 15-18 1975 v 2 p 71-87. Publ by Dtsch Ges fuer Erd-und Grundbau, Essen, Ger. 1975

The variability of textural and compaction properties of coarse grained materials of fluvial origin employed in the construction of 8 earth dams in Italy are discussed on the basis of the results of placement control tests. The shear strength of these materials is investigated by means of a broad laboratory investigation; a correlation between friction angle and the porosity is established. The influence of the variability of materials properties on the stability of an earth dam is analyzed by means of a probabilistic approach. DESCRIPTORS: (DAMS, EMBANKMENT, \*Stability), (GRANULAR MATERIALS, Analysis), SOIL MECHANICS, PROBABILITY. CARD ALERT 441, 408, 483

677651 ID NO. E1761177651

**REGRESSION ANALYSIS OF SOIL COMPRESSIBILITY.**

Azzouz, Amr S.; Krizek, Raymond J.; Corotis, Ross B.  
MIT, Cambridge, Mass

Soils Found v 16 n 2 Jun 1976 p 19-29 CODEN: SOIF8E  
Statistical techniques are used to analyze and evaluate experimental data from more than 700 consolidation tests on a large variety of undisturbed soils, and regression equations are developed to estimate the compression index and the compression ratio from classification or index data. It is found that both the compression index and the compression ratio can be reasonably well approximated by use of a simple linear regression model involving only the initial void ratio. 16 refs.

DESCRIPTORS: (SOILS, \*Consolidation), STATISTICAL METHODS, SOIL MECHANICS, REGRESSION ANALYSIS IDENTIFIERS: 483, 922, 931 CARD ALERT: 483, 922, 931

670275 ID NO. E1761070275

**FOUNDATION ANALYSIS OF MARINE GRAVITY STRUCTURES SUBMITTED TO CYCLIC LOADING.**

Rodin, J. P.; Deleuil, G.; Zaleski-Zamenhof, L. C.  
Doris, G. G.

Offshore Technol Conf 8th Annu. Proc. Houston, Tex. May 3-6 1976 v 1 Pap OTC 2475 p 571-584 CODEN: OTCB8A  
The paper presents an original method of soil analysis using elasto plastic finite elements. The method is a deterministic approach of the fatigue problems which consist in correlating cyclic laboratory test results with magnitude and duration of wave loadings. The loadings used for the soil analysis are determined by a separate statistical study. The analysis presented aims at a sound evaluation of the safety criteria of

gravity platform foundations taking into account the fatigue effects. DESCRIPTORS: (SOIL MECHANICS, \*Mathematical Models), (FOUNDATIONS, Underwater), (MARINE PLATFORMS, Foundations), CLAY. CARD ALERT: 483, 931, 405, 921

669802 ID NO. E1761069802

**DISCONTINUITY SPACINGS IN ROCK.**

Priest, S. D.; Hudson, J. A.  
Transp & Road Res Lab, Berks, Engl

Int J Rock Mech Min Sci Geomech Abstr v 13 n 5 May 1976 p 135-148 CODEN: IRMGRI

The possible distributions of discontinuity spacing along a straight line through a rock mass are considered. Unless there is a large predominance of evenly spaced discontinuities, any combination of evenly spaced, clustered and randomly positioned discontinuities leads to a negative exponential form of frequency vs. spacing value curve. The negative exponential form was confirmed by field discontinuity scanline surveys in three tunnels. Recommendations are made concerning the method of presenting discontinuity spacing data, the scanline length necessary for reasonable estimates of discontinuity frequency and the number of sample values required in a discontinuity survey. 21 refs. DESCRIPTORS: \*ROCK MECHANICS, FRACTURE MECHANICS, PROBABILITY. CARD ALERT: 483, 502, 931, 922

668555 ID NO. E176106R-55  
IMPACT OF SOIL-STRUCTURE INTERACTION ON THE PROBABILISTIC  
FREQUENCY VARIATION OF CONCRETE STRUCTURES

Hadjian, A. H.; Hamilton, C. W.  
Bechtel Power Corp., Norwalk, Calif.  
Int Conf on Struct Mech in React Technol., 3rd, Trans.,  
London, Engl., Sep 1-5 1975 v 4 pt K3/8, 10 p. Sponsored by  
Coma of the Eur Communities, Brussels, Belg., 1975.  
Earthquake response of equipment in nuclear power plants is  
characterized by floor response spectra. Since these spectra  
peak at the natural frequencies of the structure, it is  
important, both from safety and cost standpoints, to determine  
the degree of the expected variability of the calculated  
structural frequencies. The present paper extends a previous  
work on the variability of the natural frequencies of  
structures due to the variations of concrete properties and  
presents a rigorous approach to evaluate frequency variations  
based on the probability distributions of both the structural  
and soil parameters and how they jointly determine the  
distributions of the natural frequencies. The impact of soil  
properties on the structural frequencies stems from the fact  
that soil-structure interaction is an important consideration  
for massive structures. The methodology used and the results  
obtained are discussed. 5 refs.  
DESCRIPTORS: \*NUCLEAR POWER PLANTS; \*Earthquake Effects); (

CONCRETE CONSTRUCTION; Accidents; Prevention); SOIL  
MECHANICS; MATHEMATICAL TECHNIQUES; Numerical Methods).  
CARD ALERT 405, 487, 484, 617, 921, 921, 931

666799 ID NO. E176106G799  
BEARING PRESSURE UNDER FOUNDATION MATS DUE TO TRIAXIAL  
SEISMIC EXCITATION

Parisi, S. R.; Khanna, J. K.; Seltur, A. V.  
Fluor Pioneer Inc., Chicago, Ill.  
ASCE Spec Conf on Struct Des of Nucl Plant Facil., 2nd, Proc  
New Orleans, La, Dec 8-10 1975 v 1-B p 989-1006. Publ by  
ASCE, New York, NY, 1975.  
The paper proposes a rational procedure for computation of  
bearing pressures under a foundation mat due to the  
simultaneous application of dead loads and the earthquake  
forces. The method, which is based on theory of probability,  
computes the bearing pressure values with the same confidence  
limits as the applied earthquake forces. The formulas derived  
are, in general, applicable to foundation mats of arbitrary  
shapes. As a specific case, the proposed method is applied to  
a circular mat and two numerical examples of a circular  
foundation are solved. The resulting maximum bearing  
pressures are compared with the pressures available from a  
time history analysis.  
DESCRIPTORS: \*FOUNDATIONS; \*Structural Analysis); SEISMIC  
WAVES; (SOIL MECHANICS; Bearing Capacity); MATHEMATICAL MODELS  
CARD ALERT: 405, 931, 484, 483

648472 ID NO. E1760748B72  
STATISTICAL STUDY ON A CONVENTIONAL SLEEF DOUBLE QUOTES  
SAFETY FACTOR METHOD SLEEF DOUBLE QUOTES

Matsuda, Minoru; Asakura, Akira  
Miyagi Univ., Jpn.  
Pails found v 16 n 1 Mar 1976 p 75-90 CODEN: SOIFBE  
The safety factor which may be defined as the ratio of the  
resistance of a structure to the applied loads is intended to  
cover all the uncertainties about strength, loads and  
mechanical theories. In this paper mathematical structures of  
these uncertainties in the stability problem of an embankment  
are considered. Some points are discussed about the sleft  
double quotes constancy of coefficient of variation sleft  
double quotes of undrained strength in a natural ground and  
this constancy plays the role to express the transition  
process of a state of ground. The parameters of a probability  
distribution of failure are estimated under the evaluation of  
the utility of an embankment. The loss function is defined by  
two factors, the one is a probability of failure and the other  
is a preference function. This definition shows that the  
Bayesian decision criterion is most reasonable. 23 refs.  
DESCRIPTORS: \*EMBANKMENTS; (STRUCTURAL DESIGN, Safety Factor  
); STATISTICAL METHODS; SOIL MECHANICS; PROBABILITY;  
IDENTIFIERS: SHEAR STRENGTH; STABILITY ANALYSIS  
(CARD ALERT: 405, 408, 483, 922, 931

648472 ID NO. E1760748B72  
EARTH SLOPE RELIABILITY BY A LEVEL-CROSSING METHOD

Catalan, J. Maria; Cornelli, C. Allin  
Iglesias, Vasquez, Del Nido, and Bonnet, Puerto Rico  
ASCE J Geotech Eng Div v 102 n 6 Jun 1976 p 591-604  
CODEN: AJGGER6  
An approximate formulation for the reliability analysis of  
earth slopes was derived by transforming the slope reliability  
analysis problem into a level-crossing problem. solved  
approximately by finding the expected number of minima of the  
safety margin (process) that lie below zero. The main feature  
of the solution is that, in effect, it considers the slope as  
a series system with an infinite number of (correlated)  
failure modes. The formulation was used to estimate the  
probability of failure of specific earth slopes. The results  
obtained imply that the use of the failure mode of least  
reliability to approximate the probability of failure of the  
slope may be highly unconservative and may predict incorrectly  
even the signs of changes in the slope reliability with  
changes in parameter values. 14 refs.  
DESCRIPTORS: \*SOIL MECHANICS; (PROBABILITY; Random Processes  
); RELIABILITY; STRUCTURAL ANALYSIS;  
IDENTIFIERS: SLOPE STABILITY; GEOTECHNICAL ENGINEERING  
CARD ALERT: 483, 913, 922, 931

640490 ID NO. - E1760640490  
**SHEET PILE INTERLOCK TENSION-PROBABILISTIC DESIGN**  
 Kav. J. Neil  
 Cornell Univ. Ithaca, NY  
 ASCE J Geotech Eng Div v 102 n 5 May 1976 p 411-423  
 CODEN: AJGEB6

A design method based on probability theory is particularly appropriate for a cellular sheet pile-type structure in which an isolated low strength interlock can cause catastrophic failure. A probabilistic approach provides for a more consistent balance between safety and economics than does the conventional method in that it properly apportions the relative uncertainties in the design parameters for each particular problem. In this study interlock strength data were combined with probability distributions representative of uncertainty in the coefficient of earth pressure and in the cell fill unit weight. Failure probabilities for a wide range of field conditions were determined through Monte Carlo simulation. Multiple regression curve fitting techniques were then used to develop the results in a nondimensional form suitable for rapid design or analysis. A design example is given and comparisons are made with results based on the conventional approach. 14 refs.  
 DESCRIPTORS: (PILES, Driving), SOIL MECHANICS, INTERACTION, IDENTIFIERS: SHEET PILES, SOIL-STRUCTURE INTERACTION, GEOTECHNICAL ENGINEERING, PROBABILITY THEORY, EARTH PRESSURE  
 CARD ALERT: 405, 407, 483, 931

632763 ID NO. - E1760532763  
**DYNAMIC BEHAVIOR OF PIT SLOPES IN RESPONSE TO BLASTING AND PRECIPITATION**

Ko, K. C.; McCarter, M. K.  
 W. A. Wahler & Assoc, Palo Alto, Calif  
 Proc Symp Rock Mech 15th, for Meet, Custer State Park, SD, Sep 17-19 1973, Publ 1975 p 363-383 CODEN: PSRRAG  
 The complex nature of geomaterial properties, present in large open pit slopes, are difficult if not impossible to define in absolute unites. For this reason, current design procedures tend towards statistical evaluation of geologic and engineering parameters. Such procedures result in a probability analysis in which the designed slope is selected on the basis of failure risk level. A failure risk level of zero is impractical; therefore, acceptable designs must allow for possible slope failure. This paper presents a brief discussion of the rheologic model describing slope movement, various types of continuous time-displacement curves, and the effect of blasting and precipitation on quasi-stable slide areas. 3 refs.  
 DESCRIPTORS: (MINES AND MINING, Blasting), ROCK MECHANICS, RHEOLOGY  
 CARD ALERT: 507, 483, 931

Mokhnachev, M. P.; Gromova, N. V  
 A. A. Skochinskii Min Inst, Moscow, USSR  
 Sov Min Sci v 11 n 3 May-Jun 1975 p 216-219 CODEN: SMNSAT  
 Apparatus using pulsating loads and statistical processing of test results are discussed. Data are shown in graphical, tabular, and equation form. 3 refs.  
 DESCRIPTORS: (ROCK MECHANICS, Testing), (MATERIALS TESTING Fatigue)  
 IDENTIFIERS: PULSATING LOADS  
 CARD ALERT: 483, 502, 421, 422, 423

626692 ID NO. - E1760426692  
**PREDICTING THE CUTTING RESISTANCE OF POTASH ORES.**  
 Zil'bert, I. S.; In, V. A.; Lyuboshchinskii, D. M.  
 Giproleggor'mash, Karaganda, USSR  
 Sov Min Sci v 11 n 2 Mar-Apr 1975 p 160-162 CODEN: SMNSAT  
 Resistances, depths of occurrence, and contents of rockforming components were analyzed for correlations between content of insoluble residue, depth of seams, and resistance. Results are tabulated. 4 refs.  
 DESCRIPTORS: (POTASH MINES AND MINING, Cutters), ROCK MECHANICS, (CUTTING TOOLS, Testing), (MECHANICAL VARIABLES MEASUREMENT, Forces), STATISTICAL METHODS,  
 CARD ALERT: 922, 505, 603, 483, 502, 943

619654 ID NO. - E1760319654  
**EFFECT OF THE VOLUME OF THE SPECIMEN ON THE FLEXURAL STRENGTH OF MAKHRANA MARBLE.**

Kaul, B. K.; Chattopadhyay, B. C.  
 Reg Eng Coll, Kurukshetra, India  
 Symp on Rock Mech and Tunneling Probl, Proc, Reg Eng Coll, Kurukshetra, India, Dec 17-18 1973 v 1 p 200-203. Publ by Sarita Prakashan, Meerut, India, 1973  
 The effect of sample volume on the bending tensile strength of centrally loaded marble beams have been studied. Statistical approach for tensile strength of materials, based on the weakest link theory, has been supported qualitatively by the experimental results. It has been found that the so-called \$left double quote\$ material constants \$right double quote\$ involved in that theory do not remain constant as such for this rock, but fall in a reasonable range.  
 DESCRIPTORS: (ROCK MECHANICS, (MATERIALS, Mechanical Properties), MATHEMATICAL MODELS, (GEOPHYSICS, Rock Properties),  
 IDENTIFIERS: TENSILE STRENGTH  
 CARD ALERT: 483, 421, 422, 923, 481

627134 ID NO. - E1760427134  
**TENSION FATIGUE OF ROCKS.**

619649 ID NO. E1760316049  
**FACTOR OF SAFETY IN ROCK MECHANICS.**  
 Ramaswamy, S. V.  
 Symp on Rock Mech and Tunneling Probl., Proc. Reg Eng Coll.,  
 Kurukshetra, India, Dec 17-18 1973 v 1 p 155-161. Publ by  
 Sarita Prakashan, Meerut, India, 1973  
 The reliability of structures founded on or within the rock  
 mass is assessed through the factor of safety concepts in  
 which the actual factor is chosen on the basis of past  
 experience and precedent. In many cases, the safety factor  
 may be an illusion and its numerical value may not represent  
 the real margin of safety of the structure. The reliability of  
 the structure may alternately be expressed in terms of the  
 probability of the rock strength being smaller than the  
 associated stress. The paper discusses the limitations of the  
 factor of safety concept as applied to rock structures  
 frequency distributions of strength of rocks are analyzed  
 the relation between the factor of safety and the reliability  
 for some types of rocks are indicated. Refs.  
**DESCRIPTORS** -ROCK MECHANICS. (STRUCTURAL DESIGN, Safety  
 Factor).  
**IDENTIFIERS** SEISMIC ZONING, SEISMIC RISK  
**CARD ALERT** 483, 408, 922, 931

619651 ID NO. E1760316051  
**SURVEY OF THE 1ST FEBRUARY 1974 IZMIR (TURKEY) EARTHQUAKE.**  
 Karbesmen, Erhan  
 Black Sea Tech Univ, Ankara, Turk  
 Symp on Earthquake Eng, 5th, Pap and Discuss, Univ of  
 Roorkee, India, Nov 9-11 1974 v 1 p 339-350. Publ by Sarita  
 Prakashan, Nauchandi, India, 1974  
 Records were obtained from two seismoscopes located in  
 alluvial zone and in volcanic zone. Measurements of relative  
 displacement, velocity and maximum spectral acceleration taken  
 on alluvial soil were twice higher than measurements on  
 bedrock. The structural damages observed in alluvial field  
 zones were much heavier than damages observed in volcanic rock  
 zones. A statistical study has been made for reinforced  
 buildings in the immediate vicinities of the seismoscopes.  
 The buildings located near the coast seemed to be affected  
 most violently by the earthquake. A structural analysis of a  
 building which collapsed due to ground floor columns has been  
 made. 7 refs.  
**DESCRIPTORS** (\*EARTHQUAKES, \*Izmir, Turkey). (STRUCTURAL  
 ANALYSIS, Earthquake Resistance). SOIL MECHANICS. (BUILDINGS,  
 Earthquake Resistance).  
**IDENTIFIERS** GROUND MOTION, ALLUVIAL SOIL  
**CARD ALERT** 484, 483, 483, 402, 931

617222 ID NO. E1760317222  
**ANALIZA KORELACYJNA W PETROFIZYCE. Sleft brackets  
 Correlation Analysis in Petrophysics (right brackets)**  
 Jmorski, Andrzej  
 Przedsiębiorstwo Poszukiwan Geofiz, Pol  
 Tech Poszukiwan Geol v 14 n 4 1975 p 3-7. CODEN TGEODC  
 A new method of qualitative, statistical interpretation of  
 rock physical properties research is presented. The  
 calculation scheme was programmed for Odra 1204 computer. An  
 example of using such computing program in petrophysics is  
 analyzed. Investigating the relations of linear, partial or  
 multiple correlation as well as analyzing regression equations  
 and distributions of physical parameters of rocks. Equations  
 and graphs show calculations. 11 refs. In Polish with  
 English abstract.  
**DESCRIPTORS** (-GEOPHYSICS, \*Rock Properties). (ROCK  
 MECHANICS, Computer Applications). STATISTICAL METHODS.  
**CARD ALERT** 481, 483, 502, 723, 922

616063 ID NO. E1760316063  
**STUDIES FOR SEISMIC ZONATION OF THE SAN FRANCISCO BAY  
 REGION: A BRIEF SUMMARY.**  
 Borcherdt, Roger D.  
 US Geol Survey, Menlo Park, Calif  
 US Natl Conf on Earthquake Eng, Proc, Ann Arbor, Mich, Jun  
 18-20 1975 p 123-127. Publ by Earthquake Eng Res Inst,  
 Oakland, Calif, 1975  
 Studies to date indicate the feasibility of zoning the area  
 using existing geological and geophysical knowledge. Basic  
 tools derived for seismic zonation on a regional scale are a  
 map showing active faults, data on attenuation of bedrock

616049 ID NO. - E1760316049  
**DYNAMICS OF PROGRESSIVE FRACTURING AND SPATIAL DEVELOPMENT  
IN THE SOURCE REGION OF THE KOYNA EARTHQUAKES AND ENERGY  
DENSITY.**

Gosavi, P. D.; Poddale, J. G.; Marwadi, S. C.; Guha, S. K.  
Cent Water and Power Res. Stn., Poona, India  
Symposium on Earthquake Eng., 5th, Pap and Discuss., Univ of  
Roorkee, India, Nov 9-11 1974 v 1 p 415-420. Publ by Sarita  
Prakashan, Nauchandi, India, 1974  
Continuous monitoring of the Koyna earthquakes (1964 \$FM  
DASH 69) with a closely spaced net of observatories equipped  
with highly sensitive and precision instruments afforded  
unique opportunity of assessing the detailed characteristics  
of the source region of these earthquakes and its three  
dimensional development (active volume) in respect of space  
and time. The statistical relation suggested by C. Kisslinger  
(1968) for Matsushiro earthquakes is also found to broadly  
hold good for energy density of the Koyna earthquake source.  
It was found, in addition, that monthly energy densities were  
significant. The instrumental studies throw significant light  
on the dynamics of progressive fracturing of the rock mass  
subjected to overall geotectonic stress field and ultimately  
on the processes leading to gradual stability in the source  
region. 6 refs.

DESCRIPTORS: (\*EARTHQUAKES, \*India), SEISMIC WAVES, ROCK  
MECHANICS.  
CARD ALERT: 484, 483, 481, 931, 943

609665 ID NO. - E1760209665  
**OBSERVATION OF CRACKS PROPAGATING IN ROCK PLATES.**

Swan, G.  
Int J Rock Mech Min Sci Geomech Abstr v 12 n 11 Nov 1975 p  
329-334 CODEN: IRRCBG  
A velocity gauge technique applied to the measurement of  
crack propagation velocities is described. The problem of the  
observer's resolution is critically examined. The results  
obtained using the technique are inconclusive. It is  
suggested that if, as a result of further work, a multi-crack  
coalescence process is a better description of the fracture,  
then a statistical method incorporated within existing  
fracture mechanics theory could be useful for the purposes of  
predicting crack path trajectories. Data are presented in  
graphical and tabular form. 15 refs.  
DESCRIPTORS: \*FRACTURE MECHANICS, (MATERIALS, Crack  
Propagation), ROCK MECHANICS, STATISTICAL METHODS.  
CARD ALERT: 931, 483, 502, 922

600839 ID NO. - E1760100839  
**ANALYSIS OF LARGE-PANEL BUILDINGS ON STATISTICALLY  
HETEROGENEOUS FOUNDATION BEDS.**

Mikhnev, V. V.; Rybkin, G. B.; Sheinin, V. I.  
Sci-Res Inst of Found, USSR  
Soil Mech Found Eng v 12 n 2 Mar-Apr 1975 p 115-119

CODFN SNIPEAF

AS model of a randomly heterogeneous foundation bed for  
analysis of the structures interacting with it, a Winkler-type  
modification is adopted. The authors present various points  
relating to the analysis of a large-panel building on a  
statistically heterogeneous foundation bed whose nonuniform  
compressibility is determined by the modulus of subgrade  
reaction. This modulus is formulated as a stationary random  
function with normally distributed ordinates. For description  
of the soil-building mechanical system, use is made of several  
assumptions which have been adopted in the structural design  
practice and which permit reducing the analysis of the forces  
in the building to the problem of the determination of the  
interaction between the soil and a beam with an equivalent  
width, length, and generalized rigidity characteristics. 10  
refs.

DESCRIPTORS: (\*BUILDINGS, \*Foundations), SOIL MECHANICS,  
STRUCTURAL ANALYSIS,  
IDENTIFIERS: HETEROGENEOUS FOUNDATION BEDS, SOIL-STRUCTURE  
INTERACTION

CARD ALERT: 402, 405, 483, 931

575136 ID NO. - E1751175136  
**INFLUENCE OF ROCK PROPERTIES VARIABILITY ON MINE OPENING  
STABILITY ANALYSIS.**

Pariseau, W. G.  
Univ of Utah, Salt Lake City  
Can Rock Mech Symp, 9th, Proc, Montreal, Que, Dec 13-15 1973  
p 141-165. Publ by Dep of Energy, Mines and Resour., Mines  
Branch, Ottawa, Ont, 1974

Rock in mines is seldom homogeneous and rarely exhibits  
uniform properties. Variability is the rule. If the  
variability is known, then it can be incorporated directly  
into a stability analysis. The procedure is relatively simple  
and consists of inserting a block of Monte Carlo simulation  
logic into an existing finite element computer program. Three  
examples are presented that illustrate the technique and the  
influence of rock properties variability on mine design. These  
are: a slope stability problem, a roof span problem, and a  
pillar design problem. Results indicate that where safety  
factors are high, variability poses no great hazard for mine  
design. However, under conditions of large properties  
variation and low mean factor of safety, probability of  
failure may be sufficiently high to warrant reconsideration of  
a proposed mine design.

DESCRIPTORS: (\*MINES AND MINING, \*Mathematical Models), ROCK  
MECHANICS, (GEOPHYSICS, Rock Properties).  
IDENTIFIERS: FINITE ELEMENT ANALYSIS  
CARD ALERT: 502, 922, 483, 481, 401

562281 ID NO. - E1751069281  
**CREATION OF A METHODOLOGY FOR MAKING MEASUREMENTS IN SOLID ROCK.**

Yamshchikov, V. S.; Blok, A. V.  
 Sov Min Sci v 10 n 5 Sep-Oct 1974 p 626-630 CODEN: SMMSAT  
 Systematic metrological, experimental and classification approach to the problem is aimed at eliminating past errors. Defining region of action, spatial inhomogeneity of solid rock with respect to it and with respect to wavelength opens the geoaoustics way of measurement that involves also the study of the spectral-correlational structure of sounding signals. The overall approach is statistical. 12 refs.  
 DESCRIPTORS: (-ROCK MECHANICS. \*Measurement). (MEASUREMENTS. STANDARDS). MEASUREMENT THEORY. MATHEMATICAL STATISTICS. STATISTICAL METHODS.  
 CARD ALERT: 483, 502, 943, 901, 922

569280 ID NO. - E1751069280  
**ZONES OF CRUSHING IN ROCK BLASTING.**

Gaidukov, E. E.; Myzdrikov, Yu. A.  
 All-Union Sci-Res Inst of Reinf Concr, Moscow, USSR  
 Sov Min Sci v 10 n 6 Nov-Dec 1974 p 681-684 CODEN: SMMSAT  
 Graphs of the distribution density of fragment size of blasted rock fragments vs the fragment size are asymmetrical or bimodal formally, this indicates that there are three (or two) combined distributions which are set by the parameters of the blasted medium and the parameters of the blast acting on the medium. If one plots the integral distribution function of the grain-size composition of the rock on logarithmic probability paper \$left brackets\$ on which the logarithms of the dimensions of the functions x are plotted as abscissas and the cumulative frequencies as ordinates in accordance with the normal distribution \$psis\$ (((/p))) \$right brackets\$, one gets a segmented line consisting of three (or two) straight segments with different slopes. The shape of the graphs shows that the distribution of fragment size of the blasted rock consists of three (or two) log normal distributions. Data are presented in graphical and tabular form. 7 refs.  
 DESCRIPTORS: (-ROCK MECHANICS. \*Blasting). (BLASTING. Underground). (QUARRIES AND QUARRYING. Crushing and Grinding).  
 CARD ALERT: 483, 502

565960 ID NO. - E1751065960  
**STABILITY OF EMBANKMENT ON CLAY**  
 Wu, Tien H.; Thayer, William B.; Lin, Sheng S.  
 Ohio State Univ, Columbus  
 ASCE J Geotech Eng Div v 101 n 9 Sep 1975 p 913-932  
 CODEN: AJGEB6

The paper describes the failure of an embankment on clay and the investigation carried out to determine the mechanism of the failure. The slip surface passed through a thin layer of soft silty clay. Measured deformations and pore-water pressures are summarized. The shear strength of the silty

clay was measured by unconfined compression tests, triaxial tests, and simple shear tests. Stability analyses using the undrained shear strength measured by the unconfined compression test and the simple shear test give safety factors between 1.1 and 1.4. The consolidated-undrained triaxial test was found to overestimate the undrained shear strength by a considerable amount. Stability analysis using effective stress and measured by triaxial and simple shear tests also overestimate the safety factor. Probability analysis was used to evaluate the effect of the various uncertainties on the computed safety factors. 15 refs.

DESCRIPTORS: \*EMBANKMENTS. CLAY. SOIL MECHANICS. (SOILS. Pore Pressure). PROBABILITY.  
 IDENTIFIERS: SHEAR STRENGTH  
 CARD ALERT: 405, 483, 922, 931

555019 ID NO. - E1750855019  
**COMPONENT CHARACTERISTICS OF JOINTED ROCK MASSES.**

Chappell, B. A.  
 Maunsell Geotech Serv, Melbourne, Aust  
 Int J Rock Mech Min Sci Geomech Abstr v 12 n 4 Apr 1975 p 87-92 CODEN: IRMGBC

In order to use continuum elastic theory for analyzing a multi phase material, such as a jointed rock, certain assumptions are made. These assumptions are necessary so that the component characteristics or moduli can be combined to give the mass characteristics or moduli. When the material can be statistically represented as a continuum these assumptions often appear to be satisfied. The measured moduli from representative models are then used in the appropriate continuum theory. There are, however, many occasions where the assumptions are not satisfied and component responses must be considered separately. When the mechanisms of slip and rotation are considered as the component responses to deformation the resultant numerical analysis compares well with the results from physical models. It appears that slip associated with shear stresses and shear strength of the joint system is perhaps the major factor controlling the resultant load distribution in a discontinuum. Plates, diagrams, and equations demonstrate approach. 11 refs.

DESCRIPTORS: \*ROCK MECHANICS. ELASTICITY. (MATERIALS. Physical Properties) MODELS. (MATHEMATICAL TECHNIQUES. Numerical Analysis).  
 CARD ALERT: 483, 422, 901, 921

results, which have also been tabulated for C values. It has been found that equations calculated fairly closely represent experimental graphs. Analysis of the statistical model shows both qualitative and quantitative relations for deformations, increase in strength and plasticity, and makes possible to obtain a single generalized curve for the residual deformation, valid for various types of stress state. More detailed relevant data can be found in the left double quotes Catalog of the Mechanical Properties of Rocks right double quotes by the same author. 23 refs.

DESCRIPTORS: \*ROCK MECHANICS, (MATERIALS TESTING, ELASTICITY), (MATERIALS TESTING APPARATUS, Calibration), STATISTICAL METHODS.  
CARD ALERT: 483, 423, 922

540841 ID NO. - E1750640841  
FRACTAN: A COMPUTER CODE FOR ANALYSIS OF CLUSTERS DEFINED ON THE UNIT HEMISPHERE.

Shanley, R. J.; Mahtab, M. A.  
Denver Min Res Cent, Colo  
US Bur Mines Inf Circ n 8671 1975, 49 p CODEN: XMIJAL  
This report presents a computer code that has been developed by the Bureau of Mines for isolating naturally occurring clusters of data plotted on the unit hemisphere and testing these clusters against a probability distribution which admits elliptical symmetry about its mean. A listing of the computer code is provided along with an example output illustrating the delineation and analysis of clusters in fracture orientations measured in a porphyry copper deposit.  
8 refs.  
DESCRIPTORS: \*ROCK MECHANICS.  
CARD ALERT: 483, 502

536398 ID NO. - E1750636398  
DER AUSBAUERFOLG MIT SCHILDUNGSBAU. Shield brackets Results of Shield Supports Construction Right brackets.

Irresberger, Hermann  
Glueckauf v 111 n 5 Mar 6 1975 p 230-233 CODEN: GLUEAJ  
Statistical comparisons of other methods with shield supports technique show the superiority of the latter in resistance to failures and breakdowns. Diagrammatic illustrations prove the point. From Lectures by left double quotes Mine Supports and Rock Mechanics right double quotes Committee in the Ruhr, in German.  
DESCRIPTORS: (\*COAL MINES AND MINING, \*Roof Supports), MINING ENGINEERING.  
CARD ALERT: 503, 502, 901

540845 ID NO. - E1750640845  
DETERMINATION OF ROCK DISPLACEMENTS AT THE PERIPHERY OF PREPARATORY WORKINGS AFFECTED BY MINING-OUT WORK.

Chernyav, I. L.; Burchnikov, Yu. I.; Emirov, L. A.  
Sov Min Sci v 10 n 4 Jul-Aug 1974 p 426-429 CODEN: SMNSAT  
Roof and floor rocks displacements in collieries have been graphically represented, and empirical equations searched for least discrepancy between calculated and experimental values. Exponential equations answer this need. Field data are used for a multifactorial regression analysis by a computer. Also rheological parameters have been determined this way separately for the roof and floor, and their significance assessed by the Fisher F and the Student T criterion respectively. 2 refs.  
DESCRIPTORS: \*ROCK MECHANICS, MINES AND MINING, MINING ENGINEERING, (GEOLOGY, Engineering), STATISTICAL METHODS.  
CARD ALERT: 438, 502, 461, 922

540844 ID NO. - E1750640844  
STATISTICAL INTERPRETATION OF THE RESULTS OF STRENGTH TESTS ON ROCKS.

Mevdeev, R. V.  
Min Metall Inst, Aptinity, USSR  
Sov Min Sci v 10 n 4 Jul-Aug 1974 p 415-419 CODEN: SMNSAT  
The loss of integrity in the weakest section of a body, allows for 2 well-founded choice of the law of distribution of the variation series of strength indices, assumed a priori that the number of cracks is sufficiently large, that cracks are independently and randomly distributed, that distribution density of crack dimensions is exponential, and that the breaking force is a linear function of the crack dimension and decreases as the crack dimension increases. These assumptions make possible to draw a histogram of distribution of empirical series of tensile strength using both the limiting law and the normal distribution law. The law of limiting distribution remains correct in the interpretation of the strength properties of rocks, with proper alterations of the quantitative parameters. 7 refs.  
DESCRIPTORS: \*ROCK MECHANICS, (MATERIALS TESTING, Hardness), STATISTICAL METHODS.  
CARD ALERT: 483, 423, 922

540842 ID NO. - E1750640842  
STATISTICAL PRINCIPLES OF THE STRENGTH AND DEFORMATION OF ROCKS IN COMPLEX STATES OF STRESS.

Stavrogin, A. N.  
Sov Min Sci Res Inst of Mine Surv, Leningrad, USSR  
Sov Min Sci v 10 n 4 Jul-Aug 1974 p 393-406 CODEN: SMNSAT  
Rocks tested under nonuniform triaxial compression increase in volume. In a series of experiments over 10,000 specimens of 48 rock varieties have been tested with a special hydraulic apparatus with proportional load (HAPL) and different states of stress, and graphs respectively curves drawn showing the

CARD ALERT 483, 931

537539 ID NO. E175053539  
COMMENT PREVOIR LA DEFORMATION DES MASSIFS ROCHEUX. Slight brackets How to Anticipate Deformation of Rock Bodies Slight brackets

Londe, Pierre  
Burgr Ing Cons Coyne et Bellier, Fr  
Ann Mines n 2-3 Feb-Mar 1975 p 37-46 CODEN: ANMSA3  
The in situ rock-mass, particularly where engineering practice is concerned (intermediate between laboratory research and conventional geology) is not generally within the boundaries of continuum behavior. The fact that significant parameters are numerous and often ill-known compels the designer to use methods for prediction behavior, which involve, at least qualitatively, probabilistic notions. A distinction is made between problems related to the small deformations (at the surface or within the rock-mass) and large deformations (destruction of the rock-mass). In French.  
DESCRIPTORS \*ROCK MECHANICS, PROBABILITY.  
CARD ALERT 483, 502, 922

526938 ID NO. E1750426038  
WAHRSCHENLICHKEITSTHEORETISCHE BETRACHTUNGEN ZUR ERMITTLUNG BODENMECHANISCHER KENNWERTE. Slight brackets Considerations on Determination of Soil-Mechanical Characteristics. Based on the Probability Theory Slight brackets

Oswald, Otto Georg  
Ration Braunkohle, Grossraeschen-Leipzig, E Ger  
Neue Bergbautech v 5 n 1 Jan 1975 p 17-21 CODEN: NEBBAB  
Based on a literature review a description is given of the present state of knowledge of the type and mode of partition functions for soil characteristics. It is followed by a critical evaluation and conclusions are drawn for the practice of soil mechanics. 18 refs. In German.  
DESCRIPTORS \*SOIL MECHANICS, (PROBABILITY, Random Processes)  
I.  
CARD ALERT 483, 922

530843 ID NO. E1750530843  
ENGLISH AND WELSH COLLIERY SPOIL HEAPS SEM DASHES MINERALOGICAL AND MECHANICAL INTERRELATIONSHIPS.

Taylor, R. K.  
Univ of Durham, Engl  
Eng Geol v 9 n 1 Mar 1975 p 39-52 CODEN: EGGDAD  
Seventy-four post-failure triaxial test specimens from fifteen colliery spoil heaps in England and Wales have been chemically and mineralogically analyzed. Three mineral groupings emerged from statistical correlations of clay minerals, coal and carbonates, with the coal group showing strong inverse relationships with the clay-minerals group. Correlation matrices of physical and mechanical properties versus mineralogical and chemical components have enabled the main mineralogical controls on the physical characteristics to be recognized. 18 refs.  
DESCRIPTORS (\*GEOLOGY, \*Engineering), SOIL MECHANICS, MINERALOGY, COAL.  
IDENTIFIERS COLLIERIES  
CARD ALERT 481, 482, 483, 524, 931

529266 ID NO. E1750529266  
CORRELATIONS BETWEEN PLASTICITY INDICES OF CLAYS.

Galar, B. F.  
Ind and Sci Inst for Eng Surv in Constr, Stavropol', USSR  
Soil Mech Found Eng v 11 n 4 Jul-Aug 1974 p 257-258 CODEN: SMFEAF  
The author has made a comprehensive check of the relation between the plasticity indices. The initial data were obtained at surveying about 20,000 specimens and in the published literature. All indices given by the investigators were used in the statistical treatment. 14 refs.  
DESCRIPTORS \*CLAY, SOIL MECHANICS, PLASTICITY, IDENTIFIERS PLASTICITY INDICES

520864 ID NO. - E1750320864  
PROBABILITY OF PILLAR FAILURE AT ELLIOT LAKE.

Coates, D. F.  
Int Soc for Rock Mech. 3rd Congr. Proc. Pap. Denver, Colo.  
Sep 1-7 1974 v 2. Part B, p 990-996. Available from NAS,  
Washington, DC, 1974

It is not possible to design pillars in the same way that columns are designed for buildings because of the difficulty in predicting stresses and strengths. Furthermore, it is desirable in practical mine design to take into account the dispersion of stress and strength about their mean values, which cannot be done rationally using the traditional safety factor approach. The dispersion of stress in pillars comes from the variations in slope geometry, from irregular mining boundaries, and from variations in the deformability and strength of the rock substance, aside from any obvious gross geological variations. In three stopes at one of the mines at Elliot Lake, the mean stress is 10,600 psi with a coefficient of variation of 26% (of the high-side tail). The strength of pillars is difficult to determine. The dispersion of the strength of pillars is shown to arise from the variation in the properties of the constituent rock substance, again aside from the effects of any gross geological features. The mean seems to be about 18,000 psi (124 MN/m<sup>2</sup>) at Elliot Lake. The coefficient of variation looks to be in the range of 15-25%. A survey of pillar failures in various mines was shown to compare favorably with calculated probabilities of failure. 8 refs.

DESCRIPTORS: (URANIUM MINES AND MINING, \*Roof Supports), ROCK MECHANICS, (MINING ENGINEERING, Ontario).  
CARD ALERT: 482, 502, 504, 901

520818 ID NO. - E1750320818  
PROBABILISTIC APPROACH TO GEOLOGIC INVESTIGATIONS FOR HARD-ROCK TUNNELS.

Vick, Steven G.  
Dimes and Moore, Salt Lake City, Utah  
Int Soc for Rock Mech. 3rd Congr. Proc. Pap. Denver, Colo.  
Sep 1-7 1974 v 2. Part B, p 1069-1075. Available from NAS,  
Washington, DC, 1974

An approach is presented that permits specification of uncertainties in the prediction of geologic conditions along a tunnel alignment. Geologic uncertainties can be systematically described with the presented segmentation and decision tree structure. The use of probabilistic specifications of uncertainty permit the evaluation of alternative excavation or support methods on the basis of expected cost. A particular advantage of the approach is the possibility of comparing the adaptability of different construction methods to variations in geologic conditions. 4 refs.

DESCRIPTORS: (\*TUNNELS, \*Construction), ROCK MECHANICS, (GEOLOGY, Engineering), PROBABILITY.  
CARD ALERT 401, 405, 481, 482, 502, 922

519490 ID NO. - E1750319490  
METHODS FOR DETERMINING THE AVERAGE DYNAMIC ELASTIC PROPERTIES OF A FRACTURED ROCK MASS AND THE VARIATIONS OF THESE PROPERTIES NEAR EXCAVATIONS.

Bernabini, M.; Borelli, G. B.  
Univ of Rom., Italy  
Int Soc for Rock Mech. 3rd Congr. Proc. Pap. Denver, Colo.  
Sep 1-7 1974 v 2. Part A, p 393-397. Available from NAS,  
Washington, DC, 1974

Some techniques and methods for determining the average dynamic elastic properties of a rock mass, through velocity measurements between pairs of holes, are described. The measurements must be as numerous and differently oriented as possible. To obtain characteristic values of the average elastic properties and of the nonhomogeneity of the rock statistical methods are used. The seismic refraction method with geophones spaced 0.5-2 m apart is suggested for determining the variation of elastic properties near the excavation surfaces. The suggested method has given good results. Some examples are reported. 4 refs.

DESCRIPTORS: (\*ROCK MECHANICS, \*Research), (Stresses), (GEOPHYSICS, Seismic),  
CARD ALERT: 401, 481, 482, 502, 912

519471 ID NO E1750319471  
**DESIGN OF ROCK SLOPES AGAINST SLIDING ON PRE-EXISTING FRACTURES.**

McMahon, Barry K.  
Int Soc for Rock Mech, 3rd Congr, Proc, Pap, Denver, Colo, Sep 1-7 1974 v 2, Part B, p 803-808. Available from NAS, Washington, DC, 197

Procedures are presented for the design of slopes in rock of sufficient strength that failure will take place mainly by sliding along rock fractures, and that failure through the rock substance will be restricted to the relatively highly stressed region near the toe of the slope. A single parameter, the critical dip, is introduced to combine the effects of shear strength, groundwater forces, earthquake forces, and geometry of the slide mass. Blocks resting on fractures inclined at angles less than the critical dip are then stable for all orientations. Fracture orientations are then analyzed statistically to evaluate the probability of fractures, slope undercutting a fracture, or combination of fractures, dipping out of the slope at angles greater than the critical dip. The probability of failure is then obtained by multiplying the probability of the fractures having unstable orientations by the probability that the maximum lengths of the fractures are sufficient to allow failure. The statistics of fracture lengths are treated as an application of the theory of Extreme Values. The optimum design slope is selected as the slope at which the estimated total present cost of the costs of waste excavation, landslide repair, and lost production are a minimum. 7 refs.

DESCRIPTORS: ROCK MECHANICS, (GEOLOGY, Tectonics).  
IDENTIFIERS: SLOPE STABILIZATION, LANDSLIDE PREVENTION  
CARD ALERT: 481, 482, 502

518097 ID NO E1750318097  
**MECHANISM OF CAVING OF LONGWALL FACES.**

Singh, T. N., Singh, B.  
Cent Min Res Stn, Dhanbad, India  
J Mines Met Fuels v 22 n 7 Jul 1974 p 1890-195. 198-201  
CODEN JMMFAM

Positive anticipation of the ability of the roof strata to cave-in though very vital is still at an early stage of development. Different empirical and statistical approaches are being developed in many countries. Under the program of the development of equivalent material mine models, simulation of caving characteristic is one of the basic requirements. The model investigations revealed the influence of layer thickness, their rigidity, cohesion and other physicomaterial properties on caving characteristic of roof rocks. On the basis of these investigations conducted at the C. M. R. S. (Central Mining Research Station), a method is proposed to anticipate the caving behavior of any roof strata. 26 refs.

DESCRIPTORS: (MINES AND MINING, Roof Control), (COAL MINES AND MINING, Roof Control), (ROCK MECHANICS, Research).  
IDENTIFIERS: LONGWALL MINING, ROOF CAVING  
CARD ALERT: 482, 502, 503, 912

517003 ID NO E1750317003  
**RESULT OF STATE-OF-STRESS MEASUREMENTS IN DIFFERENT TYPES OF ROCK MASSES.**

Martinetti, S.; Ribacchi, R.  
Ital State Electr Board, Italy  
Int Soc for Rock Mech, 3rd Congr, Proc, Pap, Denver, Colo, Sep 1-7 1974 v 2, Part A, p 458-463. Available from NAS, Washington, DC, 197

Results of \$left double quote\$ in situ \$right double quote\$ measurements of stresses in rock masses that were enveloping underground caverns for hydroelectric power plants at six different locations with the purpose of determining the natural state of stress through the utilization of the CSIR \$left double quote\$ doorstopper \$right double quote\$ method are exposed. The paper also describes the criteria, based upon statistical models, which are applied in the interpretation of the results, the difficulties met in the practical execution of measurements, as well as the proposed improvements. 13 refs.

DESCRIPTORS: (HYDROELECTRIC POWER PLANTS, Underground).  
ROCK MECHANICS, STRAIN GAGES,  
CARD ALERT: 422, 482, 502, 611, 943

514951 ID NO. E175013951  
**MICROMECHANICS MODEL FOR CREEP OF ANISOTROPIC CLAY**  
Bazant, Zdenek P.; Ozavdin, I. Kutay; Krizek, Raymond J.  
Northwest Univ., Evanston, Ill  
ASCE J. Eng. Mech. Div. v 101 n 1 Feb 1975 p 57-78 CODEN  
JMCEA3

Clays frequently possess a fabric with a preferred particle orientation and the creep properties of such clays are therefore anisotropic. A two-dimensional microstructural model to describe this creep response is developed. The model is based on a triangular cell of three particles sliding over each other at a rate predicted by rate-process theory. Equating the rate of energy dissipation within the cell to that of the macroscopic continuum leads to the determination of the tangential viscosity matrix and the matrix of the nonviscous stress components, both of which are stress dependent. The anisotropic creep viscosity parameters then are obtained by a statistical averaging procedure based on the probability density of the particle orientation distribution, as determined by x-ray diffraction. The resulting model is able to predict the directional differences in the creep rate and the stress dependence of creep in clays with anisotropic fabric. Undrained creep tests were conducted on specimens cut in various directions from both isotropically and anisotropically consolidated kaolinite samples. 16 refs.  
DESCRIPTORS: CLAY; (MATERIALS, Creep); SOIL MECHANICS.  
IDENTIFIERS: ANISOTROPY  
CARD ALERT: 483, 931

505363 ID NO. E1750105363  
**INVESTIGATIONS OF THE RELATIONS AMONG RESIDUAL STRAIN, FABRIC, FRACTURE AND ULTRASONIC ATTENUATION AND VELOCITY IN ROCKS.**

Friedman, M.; Bur, T. R.  
Tex A & M Univ., College Station  
Int. J. Rock Mech. Min. Sci. Geomech. Abstr. v 11 n 6 Jun 1974 p  
221-234 CODEN: IRMG8G

Residual strain measured by x-ray diffractometry, fabric, and ultrasonic velocity and attenuation in blocks of dry Charcoal Granite, Sioux Quartzite, and Berea Sandstone are investigated to determine their causes and effects and the degree to which each can be used to predict fracture anisotropy. The statistical trends of tensile fractures, induced by point-loading oriented discs, are reliably predicted from ultrasonic data in all three rocks; the attenuation data reflect some not sensitive to velocity. Ultrasonic data for the bedded rocks do not correlate with any of the microscopic fabric elements studied. The tendency for tensile fractures in the sandstone and quartzite to propagate along grain boundaries more so than for the granites suggests minute openings or flaws may exist at the boundaries and these may predominantly influence fracturing and acoustic properties. 13 refs.  
DESCRIPTORS: (ROCK MECHANICS, Ultrasonic Applications). (GEOPHYSICS, Rock Properties).  
CARD ALERT: 481, 482, 502, 753

575355 ID NO. E1750105355  
**RELATIONSHIPS BETWEEN SOME PHYSICAL PROPERTIES OF ROCK DETERMINED BY LABORATORY TESTS**  
Szlavin, J.

Int. J. Rock Mech. Min. Sci. Geomech. Abstr. v 11 n 2 Feb 1974 p  
57-65 CODEN: IRMG8G

This report is concerned with a statistical survey of the results obtained from tests on samples of rock during a 5-yr period from 1965-1970. Good correlations were found between the straightforward mechanical properties, i.e. strength and hardness, and it was proved that it is possible, within reasonable limits, to make an assessment of the properties of a rock by estimation from any of the simple 'standard' tests. However, the correlations were generally not as good between the mechanical and energy properties, which suggests that the 'cuttability' of rock should be considered as an independent property and established separately by tests. Formulae and nomograms are provided from which the individual properties considered in the analyses can be estimated from any other property. Details of the limitations and errors involved in the analyses are also given. The NCR Cone Indenter was shown to be a good field instrument giving results which can be correlated with the other properties; it could be used for making rapid assessments of the rock encountered in site surveys. 4 refs.  
DESCRIPTORS: (ROCK MECHANICS, Research); ROCK DRILLING. (MATERIALS TESTING, Hardness).  
CARD ALERT: 405, 421, 422, 482, 502, 912

476232 ID NO - E174127612  
**PRESENT POSSIBILITIES OF STUDYING FOUNDATIONS OF CONCRETE DAMS.**

Rocha, Manuel  
Lisbon Tech Univ, Port  
Int Soc for Rock Mech, 3rd Congr, Proc, Pap, Denver, Colo,  
Sep 1-7 1974 v 1, Part A, p 879-897. Available from NAS,  
Washington, DC, 197

The paper presents the methods thought advisable for characterizing foundation rock masses of concrete dams, the procedures to be followed and how to express the results for their application in the design. The problem of characterizing the structure of rock masses, particularly the fracturing, is dealt with first, the important roles of geophysical methods in the first stage of characterization, and of integral sampling in the final stage, being emphasized. Deformability is considered in Chapter 3, which, after a discussion of the sensitivity of concrete dams to changes in the modulus of deformability of the foundations, presents the principles advisable for characterizing rock masses, the procedure recommended - especially the slot test which allows the characterization of large undisturbed volumes, and the dilatometer test, and finally discusses in detail the interpretation of the results of in-situ tests. As regards the strength of the foundations, the mechanisms of rupture and the concept of safety are discussed, and adequate testing procedures considering the scale effect are dealt with. The problem of strength characterization, especially by statistical methods, is also discussed. Finally the advantage of knowing the initial state of stress in rock masses is indicated. 18 refs.

DESCRIPTORS: (DAMS, GRAVITY, Foundations), (FOUNDATIONS, Bearing Capacity), ROCK MECHANICS,  
CARD ALERT: 405, 408, 441, 482, 502

475688 ID NO - E1741275688  
**APPLICATIONS OF ROCK MECHANICS IN DEEP COAL MINES OF WEST GERMANY.**

Everling, G.  
Bergbau Forsch, Essen, Ger  
Int Soc for Rock Mech, 3rd Congr, Proc, Pap, Denver, Colo,  
Sep 1-7 1974 v 1 Part B, p 1441-1450. Available from NAS,  
Washington, DC, 1974

In the West German Coal Mining Industry the laws of Rock Mechanics are studied and applied in a simple, elementary and practical manner. This report gives some examples which may be regarded as supplements and as a corroboration and realization of many details of the results derived in the General Report. The redistribution of stresses in the rock mass around longwall workings can be predicted by means of a computer program which permits the consideration of irregular workings in up to four seams. The effects of rock pressure on gateroads and longwall faces are observed underground by simple readings and measurements, and analyzed statistically. Comparisons between the calculated stresses and the effects of pressure observed underground proved significant correlations

that enable one to predict the behavior of roof, floor and walls in gateroads and at the face as well. These results confirm that in underground mining not only scientific theories but also empirical investigations may lead to useful conclusions and both methods will complement each other efficiently. 4 refs.

DESCRIPTORS: (COAL MINES AND MINING, West Germany), ROCK MECHANICS, (MINING ENGINEERING, Research), IDENTIFIERS LONGWALL MINING  
CARD ALERT: 482, 502, 503, 901, 961

471599 ID NO - E1741171599  
**ADVANCES IN HARD ROCK MINING SEM DASHES ACHIEVEMENTS AND EXPECTATIONS.**

Jahnelid, Ingvar  
R Tech High Sch, Stockholm, Swed  
World Min v 27 n 10 Sep 1974 p 60-63 CODEN: WDMIAI  
Paper analyzes the importance of rock excavation in world wide, underground and surface mining of ores and industrial minerals. The pertinent statistics show that the ratios of the volume of rock excavated in underground and surface mining to the volume of ore were 1 to 5 and 1 to 1.1 respectively. Impact of rock excavation on the total costs of mining necessitates intensive research and development work in areas of drilling, drifting and raising; rock drills; blasting; loading and transportation; as well as in rock mechanics. Recent Scandinavian achievements are reviewed.  
DESCRIPTORS: (MINES AND MINING, Operations Research), ROCK MECHANICS, (MINING ENGINEERING, Research),  
CARD ALERT: 482, 502, 901, 912

462688 ID NO - E1741062688  
**HOW ROCK STRENGTH IN THE KUZBASS DEPENDS ON GEOLOGICAL AND PHYSICAL CHARACTERISTICS.**

Stankus, V. M.; Izakson, V. Yu.; Nemshcheva, R. I.; Nemov, V. I.  
Kuzbass Polytech Inst, USSR  
Sov Min Sci v 9 n 5 Sep-Oct 1973 p 483-486 CODEN: SMNSAT  
Paper presents the results of a lithological and rock mechanical investigation of the sedimentary rock strata that occur in the Kuzbass (Soviet Union) coal field. Median data have been determined by means of mathematical, statistical methods. 2 refs.  
DESCRIPTORS: (GEOLOGY, Coal), ROCK MECHANICS, STATISTICAL METHODS,  
CARD ALERT 481, 482, 502, 503, 922

461722 ID NO. E1741061722  
**PROBABILITY OF EARTHQUAKE OCCURRENCE ESTIMATED FROM RESULTS  
OF ROCK FRACTURE EXPERIMENTS.**

Inagiwara, Yukio  
Univ of Tokyo, Jpn  
Tectonophysics v 23 n 1-2 Jul 1974 p 99-103 CODEN: TCTOAM  
The hazard rate, the number of fracture occurrences per unit  
time, which has been obtained from laboratory experiments of  
rock fracture, is obtained for the earth's crust by analyzing  
the statistical distribution of geotectonically-observed ultimate  
strain. The associated hazard function has two coefficients,  
A and B, to be determined. Comparison of the coefficients  
obtained by the results of rock-fracture experiments with the  
geotectonically determined ones discloses that B is independent  
of the size-effect. It is therefore concluded that, if A is  
estimated from the statistics of the geotectonically observed  
ultimate strain and B is obtained from fracture experiments of  
rock forming a local part of the crust, the probability of a  
local large-scale earthquake occurrence can be estimated. 2  
refs.

DESCRIPTORS: (\*EARTHQUAKES, \*Mathematical Models), ROCK  
MECHANICS, PROBABILITY.  
CARD ALERT: 482, 484, 502, 922

458649 ID NO. E1740958649  
**STATISTICAL APPROACH TO SETTLEMENT PREDICTION.**  
Matsuo, Minoru; Asaoka, Akira  
Proc Jap Soc Civ Eng n 255 May 1974 p 63-74 CODEN: DGRHAD  
15 refs. In Japanese.  
DESCRIPTORS: \*SOIL MECHANICS, (FOUNDATIONS, Settlement),  
STATISTICAL METHODS.  
CARD ALERT: 405, 483, 922, 931

453712 ID NO. E1740953712  
**KONTROLA STABILNOSCI CHODNIKOW KOTWIONYCH. Sleft brackets  
Controlling the Stability of Roadways Supported by Rock  
Bolting Sleft brackets**

Bachacou, J.; Raffoux, J. F.; Dudek, J.; Magron, A.  
Polytech Wroclaw, Pol  
Przegi Gorn v 30 n 1 Jan 1974 p 47-56 CODEN: PRGDAI  
Two-part paper discusses the typical forms of the  
roof-failure in roadways and techniques for prevention by  
means of roof bolts. Methods for monitoring the proper action  
of the sleft-end bolts and criteria of roof-failure hazards are  
examined. In part-2 statistical data pertinent to the  
application of rock bolts in the coal mines of the Lorraine,  
France region is given. Monitoring system that consists of  
measuring the stress relief in roof strata and rate of  
conveyance of the roof and the floor in regular time intervals  
as well as of computerizing these data is described. Computer  
is programmed to signal sleft double quotes critical sleft  
double quotes spots. In Polish.  
DESCRIPTORS: (\*COAL MINES AND MINING, \*Roadway Supports),  
ROCK MECHANICS, (DATA PROCESSING, Natural Sciences

Applications),  
IDENTIFIERS: ROCK BOLTS  
CARD ALERT: 482, 502, 503, 723

445439 ID NO. E1740745439  
**TUNNELING MACHINE RESEARCH.**  
Rad, Parviz F.; Olson, Richard C.  
Twin Cities Min Res Cent, Minn  
US Bur Mines Rep Invest RI 7882 1974, 40 p CODEN: XBMJAG  
The Bureau of Mines used a linear cutting apparatus equipped  
with a 7-inch disk cutter to cut grooves in marble, limestone,  
granite, and quartzite under a normal force of 7,000 lb. The  
size distribution of the muck for various grooves was  
determined through sieve analysis. A statistical search showed  
that Weibull distribution describes the size distribution  
better than other available functions. Results indicate that  
fineness modulus, chip population, and dimension of the  
largest chip can be used as indicators of cutting efficiency.  
The results correlate with those obtained from the boring  
machines and other lab experiments. Application of the  
principles established through this work to the operation of  
boring machines is explained. 10 refs.  
DESCRIPTORS: (\*TUNNELS, \*Construction), ROCK MECHANICS, (  
CUTTING TOOLS, Carbide).  
IDENTIFIERS: TUNNEL BORING MACHINES, ROCK CUTTING  
CARD ALERT: 401, 405, 482, 502, 603

DIALOG FILE COMPENIX TO 87/AUG (Copr. Engineering Information Inc) See NEWS (Item 267 of 317) User 5708 1sep82 7217

441103 ID NO E1740741103  
TEMPORARY AND PERMANENT EARTH ANCHORS: THREE MONITORED INSTALLATIONS.

Tron, William A.  
William Iron Assoc Ltd, Rexdale, Ont. CODEN: GGJ0AH  
Can Geotech J v 11 n 2 May 1974 p 257-268  
This paper presents the results of measurements of earth anchor performance for three separate installations in Metropolitan Toronto. The first case records the results of instrumentation on the high grout pressure Bauer anchor used to support an approximately 30 ft (9.1 m) deep excavation in dense fine sand. The second presents the load measurements made on low grout pressure earth anchors installed in very stiff clay of a 29 ft (8.8 m) excavation. The third installation involved measurements on permanent vertical anchors set in extremely dense silt fill. In the first instance, the average measured load was somewhat lower than the installed load and the design assumption. In the second case, in the stiff clay, the load was somewhat higher than the design value but this was attributed to the probability of load transfer because of inadequate support at lower levels. In this case, considerable variation and possible overstressing of anchor wires was noted. A very high uplift resistance was recorded for the permanent anchors in dense silt. Control of groundwater during installation of these anchors was the principal lesson learned from this work. 3 refs.

DESCRIPTORS: (\*FOUNDATIONS, \*Anchorage), SOIL MECHANICS, IDENTIFIERS EARTH ANCHORS  
CARD ALERT 405, 483

436724 ID NO E1740636724  
STATISTICAL COMPARISON OF THE PULSE AND RESONANCE METHODS FOR DETERMINING ELASTIC MODULI

Thill, Richard E.; Peng, Syd S  
Twin Cities Min Res Cent, Minneapolis, Minn  
US Bur Mines Rep Invest n 7831 1974, 24 p CODEN: XBMTA6  
Elastic wave velocities and moduli were determined by both the pulse and resonance methods in a large number of specimens of St. Cloud Gray granodiorite and Tennessee marble under the same moisture, temperature, and stress environment. Long cylinders were first tested by the resonance method to obtain longitudinal bar and torsional wave velocity. The cylinders were then sectioned in half and tested by the pulse method to obtain the transient pulse velocity. These velocities were later used to obtain various moduli for comparison. 50 refs.

DESCRIPTORS: \*ROCK MECHANICS,  
CARD ALERT 482, 502

429862 ID NO E1740529862  
UNCERTAINTY, SAFETY, AND DECISION IN SOIL ENGINEERING.

Mo, Fien H  
Ohio State Univ, Columbus  
ASCE J Geotech Eng Div v 100 n G13 Mar 1974 Pap 10434 P

329 348 CODEN AUGE86  
Probability and decision theory are used to solve the decision problems in subsurface exploration, design of a foundation on clay, and design of inaccuracies in measurement of soil strength and variability of natural soil deposits are considered and a model of the design and decision process is developed to account for the available information, the experience, and the costs of investigation and failure. 36 refs.

DESCRIPTORS: (\*SOILS, \*Surveys), SOIL MECHANICS, FOUNDATIONS, Settlement), CLAY, SAND AND GRAVEL, PROBABILITY, IDENTIFIERS: DECISION THEORY  
CARD ALERT: 405, 483, 922, 931

429301 ID NO E1740529301  
PROBABILISTIC ANALYSIS AND DESIGN OF A RETAINING WALL.

Ilies, Kaare; Murarka, Ramesh P.  
Stanford Univ, Calif  
ASCE J Geotech Eng Div v 100 n G13 Mar 1974 Pap 10436 P  
349-366 CODEN AUGE86  
The procedure is illustrated by analyzing and designing a gravity retaining wall first by conventional, deterministic procedures, and subsequently, by a probabilistic approach. The term safety margin is introduced and defined as the difference between resistance and load, both random variables. It is pointed out that the probability of failure does not depend on the mean value of the safety margin, but on the coefficient of variation. 26 refs.

DESCRIPTORS: \*RETAINING WALLS, SOIL MECHANICS, STATISTICAL METHODS, PROBABILITY, IDENTIFIERS SAFETY FACTOR  
CARD ALERT: 405, 483, 922, 931

427960 ID NO. - E1740527960  
**SEISMOAKUSTISCHE UNTERSUCHUNGEN ZUR VORHERSAGE VON GEBIRGSSCHLAGEN** **stieft brackets Seismoacoustic Investigations for Forecasting of Rock Bursts stieft brackets**  
Rainer, H.; Sklenar, J.; Humbernigg, H.; Kostelka, I.; Czech Acad of Sci, Holesovick Berg Huettebaum Monats v 118 n 12 Dec 1973 p 375-384 CODEN BHMMAM

Paper outlines the importance of the rock burst hazard in mines, tunnels etc from the viewpoint of accident prevention and economics of mining operations as well as brings into focus the accompanying seismic and acoustic phenomena. The investigated lead-zinc deposit stieft double quotes Bleiberg stieft double quotes is located on the Austrian Yugoslav border in the triassic formation known under the name stieft double quotes Kalkalpen stieft double quotes (calcareous Alps) and is characterized by very frequent occurrences of rock bursts. (Statistics for the period 1960-1972 are enclosed). Classification of rock burst proneness of various rocks based on SEM DASH stress dependent-frequency of impulses is presented as well as the application of the seismoacoustic method for determining the hazard of a rock burst is described. Evaluation of the seismoacoustic soundings is outlined. 15 refs. In German.  
DESCRIPTORS: (-MINES AND MINING. \*Rock Bursts). (GEOPHYSICS, Seismic). ROCK MECHANICS.  
IDENTIFIERS: LEAD ZINC MINES AND MINING AUSTRIA  
CARD ALERT: 481, 482, 484, 502

427957 ID NO. - E1740527957  
**ROCK MECHANICS AND RISK IN OPEN PIT MINING.**  
Pariseau, William G.  
Univ of Utah, Salt Lake City  
Int Symp on Comput Appl in the Miner Ind, 11th, Proc, Tucson, Ariz, Apr 16-20 1973 v 1, Sect A, p 105-124. Available from Univ of Ariz, Coll of Mines, Tucson, 1973  
It is difficult and rather hazardous to generalize about slope stability except in the broadest of terms. Material properties, applied loads, geologic features, and ground water are major components of stability analyses regardless of the mathematical model used to calculate stresses, deformation and displacements. Other factors such as vibration and blasting will also affect slope stability. In all these there is variability and uncertainty that affect the risks and reward anticipated in mine planning for open pit mines. While rewards are relatively simple to compute through present value analysis risks are not. The incorporation of a Monte Carlo simulator into a finite element computer program that is capable of modeling progressive slope failure as presented in this paper provides a direct method of coping with uncertainties arising from variability in means and stability parameters such as rock strength. An almost unlimited number of material types of arbitrary distribution can be employed without added computer storage, provided the random number generator in the Monte Carlo simulator can be

main to repeat sequences. 27 refs.  
DESCRIPTORS: (-MINES AND MINING. \*Open Pit). ROCK MECHANICS. MATHEMATICAL STATISTICS. Monte Carlo Methods).  
IDENTIFIERS: SLOPE STABILITY  
CARD ALERT: 482, 502, 922

422808 ID NO. - E1740422808  
**VAZKE TECENI ZEMIN. stieft brackets Creep of Soils stieft brackets.**  
Feda, Jaroslav  
Stavebnicky Cas v 21 n 10 1973 p 732-756 CODEN: STVCA2  
An example of two types of a creep test is shown. The paper describes a structural concept based on H. Eyring's kinetic theory. Creep is shown to be a thermally-activated process which may be described in terms of statistical thermodynamics. The principal propositions of this theory are explained and the connection of various relationships with the phenomenological relationship is discussed. A kinetic theory of strength of solids was developed. 35 refs. In Slovak.  
DESCRIPTORS: (-SOILS. \*Creep). SOIL MECHANICS. THERMODYNAMICS.  
IDENTIFIERS: KINETIC THEORY OF SOLIDS  
CARD ALERT: 483, 641, 931

422800 ID NO. - E1740422800  
**STATISTISCHE FESTIGKEITS- UND VERFORMUNGSANALYSEN DES UNTERGRUNDES. stieft brackets Statistical Analysis of Stability, Compactness and Deformation of Subgrades stieft brackets.**  
Brandl, H.  
OIV, Vienna, Austria  
Orsterr Ing-Z v 16 n 12 Dec 1973 p 398-403 CODEN: OSIZAN In German.  
DESCRIPTORS: \*SOIL MECHANICS. (FOUNDATIONS, Piles). ROCK MECHANICS. STATISTICAL METHODS.  
IDENTIFIERS: SUBGRADES, DEFORMATION  
CARD ALERT: 405, 483, 922, 931

42342 ID NO. EI740120312  
**STRESS STATE OF ROCKS AT THE ACTUAL BOUNDARY OF A MINE WORKING.**

Shimin, V. I.  
Sci-Res Inst of Found Beds and Underground Constr., USSR  
Soil Mech Found Eng v 10 n 4 Jul-Aug 1973 p 284-289  
CODEN SMFEAF

A solution of the problem was obtained for a nonhydrostatic initial stress state in the rock mass, and formulas derived for computing the statistical characteristics of the stresses. From analyzing the result of this solution, made by considering the actual relations of irregularities and designed boundaries, recommendations are offered for an approximate determination of the stresses with a designed noncircular outline.

DESCRIPTORS: \*ROCK MECHANICS, MINES AND MINING, MATHEMATICAL MODELS.  
CARD ALERT 483, 502, 922

41547 ID NO. EI740315447  
**COMPUTER CLASSIFICATION OF RESERVOIR SANDSTONES.**

Haralick, R. M.; Shanmugam, K.  
Univ of Kans Cent for Res Inc, Lawrence  
IEEE Trans Geosci Electron v GE-11 n 4 Oct 1973 p 171-177  
CODEN IFGEAN

A procedure is developed to extract numerical features which characterize the pore structure of reservoir rocks. The procedure is based on a set of descriptors which give a statistical description of porous media. These features are evaluated from digitized photomicrographs of reservoir rocks and they characterize the rock grain structure in terms of (1) the linear dependency of gray tones in the photomicrograph image, (2) the degree of 'left double quotes homogeneity variations of the image gray tone dependencies. On the basis of these textural features, a simple identification rule using piecewise linear discriminant functions is developed for categorizing the photomicrograph images. The procedure was applied to a set of 243 distinct images comprising 6 distinct rock categories. The coefficients of the discriminant functions were obtained using 143 training samples. The remaining 100 samples were then processed, each sample being assigned to one of 6 possible sandstone categories. Eighty-nine per cent of the test samples were correctly identified 18 refs.

DESCRIPTORS: (\*RESERVOIRS, \*Rock Mechanics), ROCK MECHANICS, COMPUTERS, DIGITAL.  
CARD ALERT 441, 483, 722

COOPER, LIRMAZ

Intuitive rock mechanics research concerned with introducing new technology into mine design has been conducted during the past few years at the Elliot Lake Laboratory of the Mines Branch. The measurement of pillar stresses has been an important element of this work. The variation obtained in these measurements makes it difficult to use the design concept of safety factor (relating average strength to average stress). On the other hand, the explicit use of measurements of variability for design analysis is particularly appropriate in mining. Selection of failure probability can then take into account the consequences of instability, and the economics of failure can be introduced into financial analysis. It was found that the total coefficient of variation of the measured pillar stresses is 22 per cent. The calculated contribution to the total coefficient of variation from irregularities in the slope geometry is 18 per cent, the effect of irregular mining boundaries by itself is the source of an additional 18 per cent, and the variability of the stiffness of the rock substance could produce another 22 per cent. These sources of variability are more than adequate to explain the measured variance, which must be now considered real and not the product of measurement error. 10 refs.

DESCRIPTORS: (\*MINES AND MINING, \*Roof Supports), ROCK MECHANICS, (STRESSES, Measurement).  
CARD ALERT: 408, 421, 482, 502, 504

404856 ID NO. EI740104856  
**DEFLECTION OF BURIED PIPES.**

Watkins, Reynold K.; Smith, Albert B.  
Utah State Univ Logan  
J. Am. Water Works Assoc v 65 n 9 Part 1 Sep 1973 p 588-593  
CODEN JAWWAS

The research to improve methods of predicting ring deflection of buried, large-diam pipes subjected to external soil pressure. A simple relationship was found between ring deflection, the predicted vertical soil strain, and the stiffness ratio, which generally confirms theory but is reported to be simpler, more accurate, and establish statistical confidence levels.

DESCRIPTORS: (\*WATER PIPELINES, \*Management), SOIL MECHANICS IDENTIFIERS: DEFLECTION, BURIED PIPES  
(CARD ALERT: 446, 483, 619)

408198 ID NO. EI740208198  
**VARIANCE OF PILLAR STRESSES AT ELLIOT LAKE.**

Coates, D. F.  
Min Res Cent, Ottawa, Ont  
Int J Rock Mech Min Sci v 10 n 6 Nov 1973 p 627-640

40194 ID NO. - E1730737278  
**ACCEPTANCE SPECIFICATION OF COMPACTED SOILS.**  
Kraft, Leland M. Jr.; Young, Jimmy Yew-Hang  
Highw Res Rec n 438 1973 p 21-33 CODEN HIRRAJ  
An investigation of the failure probability of linear elastic heterogeneous embankments is reported, and illustrations are given for incorporating those results into acceptance specifications. Failure is defined in terms of deformations 18 refs  
DESCRIPTORS: (-SOILS. \*Compaction). (ROADS AND STREETS. Stabilization). SOIL MECHANICS. FAILURE ANALYSIS.  
EMBANKMENTS.  
CARD ALERT: 406, 483

337666 ID NO. - E1730737666  
**OFFSHORE TECHNOLOGY CONFERENCE, 4TH, 1972.**  
Conf  
Offshore Technol Conf, 4th, Annu, Houston, Tex, May 1-3 1972. Prepr. Pap. 2 Vol. Various Pagings Publ by Offshore Technol Conf, Dallas, Tex, 1972. Available from IEEE (72 CHO 594 1-TAR), New York  
One hundred and sixty nine papers are presented. The topics discussed are various aspects of oceanography; methods of combating oil spills; the design of mooring cables and submarine pipelines; studies of underwater welding; the drilling of and equipment for offshore oilwells; the design and stress analysis of marine platforms; analysis of problems encountered in the Arctic environment; soil mechanics studies related to pile driving; and wave statistics and wave spectra etc. Selected papers are indexed separately.  
DESCRIPTORS: \*UNDERSEA TECHNOLOGY. (WATER POLLUTION. Oil Soils). MARINE PLATFORMS. (OIL WELL DRILLING, Offshore). SUBMERSIBLES. (PIPELINES, Offshore).  
IDENTIFIERS: DRILL SHIPS  
CARD ALERT: 453, 472, 511, 674

337283 ID NO. - E1730737283  
**INTERNATIONAL CONFERENCE ON MICROZONATION FOR SAFER CONSTRUCTION RESEARCH AND APPLICATION, PROCEEDINGS, 2 VOLUMES, 1972.**  
Algermissen, S. T.; Perkins, David M.; Dewey, James W.; Dillinger, William H.; Taggart, James; Stepp, J. C.; Harding, Samuel T.; Campbell, Kenneth W.; Espinosa, A. F.; Matthiessen, R. P.; Rojahn, C.  
Int Conf on Microzonation for Safer Constr Res and Appl. Proc. Seattle, Wash, Oct 30-Nov 3 1972. 2 Vol. 987 p. Sponsored by NSF, UNESCO, Univ of Washington, ASCE, and Am Acad of Mech Publ by Conf on Microzonation, Seattle, Wash, 1972  
Following is the continuation of the list of titles and authors of the papers presented: Field Measurements of Dynamic Pore Pressure During Pile Driving. By Kenji Ishihara and Shimpel Mitsui. Shear Modulus Determination of Soils by In Situ Methods for Earthquake Engineering. By Raymond P. Miller and Fred R. Brown. Probabilistic Approach to Seismic Zoning of an Industrial Site. By Neville C. Donovan and Julio E. Valera. Geological Environment: Definition by Remote Sensing. By Roy E. Hunt. Various Techniques for Making In Situ Shear Wave Velocity Measurements SEM DASHs: A Description and Evaluation. By Sigmund D. Schwarz and John M. Musser, Jr. Number of Equivalent Significant Cycles in Strong Motion Earthquakes. By Kenneth L. Lee and Kwok Chan. Soil and Earthquake Uncertainties on Site Response Studies. By I. Arango and R. J. Dietrich. Statistical Analysis of 1971 San Fernando Earthquake Ground-Motion Data. By S. C. Liu.  
DESCRIPTORS: (-STRUCTURAL DESIGN. \*Earthquake Resistance). (CONSTRUCTION INDUSTRY, Research). (GEOPHYSICS, Seismic). SOIL MECHANICS. (FOUNDATIONS, Earthquake Resistance).  
IDENTIFIERS: MICROZONATION, ZONATION  
CARD ALERT: 405, 408, 483, 484, 901

337278 ID NO. - E1730737278  
**INTERNATIONAL CONFERENCE ON MICROZONATION FOR SAFER CONSTRUCTION RESEARCH AND APPLICATION, PROCEEDINGS, 2 VOLUMES, 1972.**  
Ishihara, Kenji; Shimpel, Miller, Raymond P.; Brown, Fred R.; Donovan, Neville C.; Valera, Julio E.; Hunt, Roy E.; Schwarz, Sigmund D.; Musser, John M. Jr.; Lee, Kenneth L.; Chan, Kwok; Arango, I.; Dietrich, R. J.; Liu, S. C.  
Int Conf on Microzonation for Safer Constr Res and Appl. Proc. Seattle, Wash, Oct 30-Nov 3 1972. 2 Vol. 987 p. Sponsored by NSF, UNESCO, Univ of Washington, ASCE, and Am Acad of Mech Publ by Conf on Microzonation, Seattle, Wash, 1972  
Following is the continuation of the list of titles and authors of the papers presented: Field Measurements of Dynamic Pore Pressure During Pile Driving. By Kenji Ishihara and Shimpel Mitsui. Shear Modulus Determination of Soils by In Situ Methods for Earthquake Engineering. By Raymond P. Miller and Fred R. Brown. Probabilistic Approach to Seismic Zoning of an Industrial Site. By Neville C. Donovan and Julio E. Valera. Geological Environment: Definition by Remote Sensing. By Roy E. Hunt. Various Techniques for Making In Situ Shear Wave Velocity Measurements SEM DASHs: A Description and Evaluation. By Sigmund D. Schwarz and John M. Musser, Jr. Number of Equivalent Significant Cycles in Strong Motion Earthquakes. By Kenneth L. Lee and Kwok Chan. Soil and Earthquake Uncertainties on Site Response Studies. By I. Arango and R. J. Dietrich. Statistical Analysis of 1971 San Fernando Earthquake Ground-Motion Data. By S. C. Liu.  
DESCRIPTORS: (-STRUCTURAL DESIGN. \*Earthquake Resistance). (CONSTRUCTION INDUSTRY, Research). (GEOPHYSICS, Seismic). SOIL MECHANICS. (FOUNDATIONS, Earthquake Resistance).  
IDENTIFIERS: MICROZONATION, ZONATION  
CARD ALERT: 405, 408, 483, 484, 901

337283 ID NO. - E1730737283  
**INTERNATIONAL CONFERENCE ON MICROZONATION FOR SAFER CONSTRUCTION RESEARCH AND APPLICATION, PROCEEDINGS, 2 VOLUMES, 1972.**  
Algermissen, S. T.; Perkins, David M.; Dewey, James W.; Dillinger, William H.; Taggart, James; Stepp, J. C.; Harding, Samuel T.; Campbell, Kenneth W.; Espinosa, A. F.; Matthiessen, R. P.; Rojahn, C.  
Int Conf on Microzonation for Safer Constr Res and Appl. Proc. Seattle, Wash, Oct 30-Nov 3 1972. 2 Vol. 987 p. Sponsored by NSF, UNESCO, Univ of Washington, ASCE, and Am Acad of Mech Publ by Confon Microzonation, Seattle, Wash, 1972  
Following is the continuation of the list of titles and authors of the papers presented: General Consideration and Parameters. By S. T. Algermissen and David M Perkins. Analysis of Earthquake Locations and Mechanisms in Northern Utah, Wyoming, Idaho and Montana. By James W. Dewey, William M. Dillinger, James Taggart and S. T. Algermissen. Analysis

326145 ID NO E1730526781  
PHYSICAL NATURE OF THE BURST PROMINENCE OF BROWN COAL SEAMS.  
Petukhov, I. M.; Akinshin, B. I.; Volkov, E. V.  
VNIMI, Leningrad, USSR  
Sov Mining Sci v 8 n 3 May-Jun 1972 p 246-249 (CODEN  
SMMSAT)  
Rock burst amounts to brittle fracture of coal in the limiting stress zone in the marginal sector of coal seam. The probability of its occurrence is largely determined by the mechanical properties of the coal in situ. A characteristic property of all lignite deposits is that they usually consist of thick seams of highly porous (30-60%) and completely water-saturated coals. The two-phase structure of lignite with very high moisture content indicates that their mechanical properties may depend significantly on the ratio of the solid and liquid phases, whose investigation is reported.  
10 refs.  
DESCRIPTORS (-LIGNITE MINES AND MINING; \*Rock Bursts); ROCK MECHANICS.  
IDENTIFIERS: COAL BURSTS  
CARD ALERT: 482, 502, 503

326146 ID NO E1730526782  
PHYSICAL NATURE OF THE BURST PROMINENCE OF BROWN COAL SEAMS.  
Petukhov, I. M.; Akinshin, B. I.; Volkov, E. V.  
VNIMI, Leningrad, USSR  
Sov Mining Sci v 8 n 3 May-Jun 1972 p 246-249 (CODEN  
SMMSAT)  
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10 refs.  
DESCRIPTORS (-LIGNITE MINES AND MINING; \*Rock Bursts); ROCK MECHANICS.  
IDENTIFIERS: COAL BURSTS  
CARD ALERT: 482, 502, 503

326816 ID NO E1730420816  
STOCHASTIC STUDY ON SOME PROPERTIES AND FAILURE PROBABILITY FOR UNSATURATED SOILS.  
Matsuo, Minoru; Kuroda, Katsuhiko  
Proc Jap Soc Civ Eng n 208 Dec 1972 p 65-75 CODEN: DGRHAD  
16 refs. In Japanese.  
DESCRIPTORS (-SOILS; \*Testing); SOIL MECHANICS.  
IDENTIFIERS: SHEAR STRENGTH, SATURATION  
CARD ALERT: 483, 931

326816 ID NO E1730420816  
STOCHASTIC STUDY ON SOME PROPERTIES AND FAILURE PROBABILITY FOR UNSATURATED SOILS.  
Matsuo, Minoru; Kuroda, Katsuhiko  
Proc Jap Soc Civ Eng n 208 Dec 1972 p 65-75 CODEN: DGRHAD  
16 refs. In Japanese.  
DESCRIPTORS (-SOILS; \*Testing); SOIL MECHANICS.  
IDENTIFIERS: SHEAR STRENGTH, SATURATION  
CARD ALERT: 483, 931

319714 ID NO E1730419714  
MODEL INVESTIGATIONS OF PILE GROUPS IN SAND.  
Tejchman, Andrzej F.  
ASCE J Soil Mech Found Div v 99 n SM2 Feb 1973 Pap n 9579 p 199-217 CODEN: JSFEAQ  
Analysis of the bearing capacity and pile action of pile groups in cohesionless soil. Model tests were conducted in loose and compacted sand, and applied to various types of pile groups: square, rectangular, and single row. The groups also varied in pile number and spacings. The calculation of the bearing capacity of the piles was analyzed by means of statistical equations that assumed the bearing capacity of a single pile to be composed of the sum of the resistance of the pile point and skin. 24 refs.  
DESCRIPTORS (-PILES; \*Bearing Capacity); SOIL MECHANICS, SAND AND GRAVEL.  
IDENTIFIERS: PILE GROUPS  
CARD ALERT: 405, 483

326781 ID NO E1730526781  
NORTH AMERICAN RAPID EXCAVATION AND TUNNELING CONFERENCE, 1972.  
Newcomb, R.; Haffen, M.; Janin, J.; Gates, R. H.; Hendon, A. J.; Oriard, L. L.; Savena, D. S.; Tuttle, J. K.  
North Am Rapid Excavation and Tunneling Conf. Proc. Sponsored by ASCE and AIME, Chicago, Ill., Jun 5-7 1972, 2 Vol., 1684 p Publ by Soc of Min Eng of AIME, New York, 1972  
Following is the continuation of the list of titles and authors of papers presented: Realism in Statistical Demand Forecasting. The Economic Challenge. By R. Newcomb. Grouting. Cohesionless Water Bearing Soils in City Tunnels. By M. Haffen and J. Janin. Explosive Excavation Research. By R. H. Gates. Specifications for Controlled Blasting in Civil Engineering Projects. By A. J. Hendon, Jr. and L. Oriard. Controlled and Monitored Rock Excavations in Urban Areas. By D. S. Savena and J. K. Tuttle.  
DESCRIPTORS (-TUNNELS; \*Construction); EXCAVATION, ROCK STRUCTURAL DESIGN, Underground); CONSTRUCTION EQUIPMENT, ROCK MECHANICS, SOIL MECHANICS.  
IDENTIFIERS: TUNNELING  
CARD ALERT: 401, 405, 408, 483, 931

326221 ID NO E1730526221  
PROBABILISTIC ANALYSIS OF SEEPAGE.  
Wu, Tien H.; Vyas, Shyam K.; Chang, Nien Yin.  
Ohio State Univ, Columbus  
ASCE J Soil Mech Found Div v 99 n SM4 Apr 1973 Pap 9687 p 323-340 CODEN: JSFEAQ  
A method was developed for the analysis of seepage through nonhomogeneous soil deposits. The layers of pervious soils in the deposit were considered as inclusions within a medium of

304573 ID NO. - E1730104573  
UNCERTAINTY OF SETTLEMENT ANALYSIS FOR OVERCONSOLIDATED CLAYS.

Krzizek, Raymond J.; Kay, J. Neil  
Northwestern Univ., Evanston, Ill  
Highw Res Rec n 405, 1972 p 143-151 CODEN: HIRRAJ  
The uncertainty associated with using the Skempton Bjerrum method for settlement determination in overconsolidated clays is evaluated by means of a probabilistic procedure wherein the deterministic parameters are represented by appropriate probability distribution functions. 7 refs  
DESCRIPTORS: (\*SOILS. \*Consolidation), SOIL MECHANICS, CLAY, ROADS AND STREETS.  
IDENTIFIERS: SETTLEMENT ANALYSIS  
CARD ALERT: 406, 483

300670 ID NO. - E1730100670  
MOEGLICKEITEN ZUR BESTIMMUNG DER BEANSPRUCHUNG DES HAUPTTHANGENDEN ALS ABBAUFOLGE. Sleift brackets possibilities of Determining Stresses in Overburden Strata Caused by Mining Exploitation (Slight brackets).

Fenk, Jueigen  
Bergakademie Freiberg, E Ger  
Neue Bergbautech v 2 n 8 Aug 1972 p 601-606 CODEN: NEBRAB  
The necessity of gaining insight into the behavior of overburden strata requires: surveying and periodical monitoring of strata displacement through measurements in boreholes, mine shafts etc; simulation of these displacements on physical models and their evaluation; and processing of secured data by known computerized techniques, among which the T. Kochmanski statistical integral theory is mentioned. 7 refs. In German.  
DESCRIPTORS: (\*COAL MINES AND MINING. \*Subsidence), (COAL MINES AND MINING. Models), ROCK MECHANICS, MATHEMATICAL STATISTICS.  
CARD ALERT: 502, 503, 922

297180 ID NO. - E1721319182  
STATISTICAL THEORY OF THE POLYAXIAL COMPRESSIVE STRENGTH OF MATERIALS.

Lundborg, N.  
Swedish Detonic Res Found, Vinterviken, Stockholm, Swed  
Int J Rock Mech Min Sci v 9 n 5 Sep 1972 p 617-624 CODEN: IJRMAS  
Weibull's statistical theory of strength, extended to compressive stresses, is used in calculating the influence of the intermediate principal stress on the strength. The effective shear stress is calculated and integrated over the solid angle where the effective shear stress is greater than zero and the probability of rupture in polyaxial compression is calculated. The results are in good agreement with experimental results. 9 refs.  
DESCRIPTORS: \*ROCK MECHANICS, STRENGTH OF MATERIALS.  
CARD ALERT: 421, 422, 502

293377 ID NO. - E1721215378  
NEW APPROACH TO THE DYNAMIC BREAKAGE OF ROCK.

Kennedy, P A  
Geotechnical Engineering Ltd, Gloucester, Eng  
Tunnels Tunnelling v 4 n 5 Sep Oct 1972 p 477-479 CODEN: TUIURV  
A new method of dynamic breakage of rock has been developed utilizing the secondary breakage effect from an electrical pulse passed through electrodes into rock specimens. Breakage was achieved for the three rock types tested. The amount of breakage was analysed in terms of increased surface area using a computerised statistical method. From experimental results and a review of available literature, it seems that this method of dynamic breakage is at least as efficient as conventional chemical blasting. 14 refs.  
DESCRIPTORS: \*ROCK MECHANICS,  
IDENTIFIERS: DYNAMIC ROCK BREAKAGE  
CARD ALERT: 502

293315 ID NO. - E1721215316  
ANALYSIS OF FRACTURE ORIENTATIONS FOR INPUT TO STRUCTURAL MODELS OF DISCONTINUOUS ROCK.

Maitab, M A.; Bolstad, D. D.; Allredge, J R.; Shanley, R.  
Denver Mining Res Center, Colo  
U S Bur Mines, Rep Invest RI n 7669, 1972, 76 p  
This report presents a new procedure for analyzing the orientations of rock fractures in an engineering site. The procedure, coded in a computer program, identifies clusters or groupings among the fracture orientations and calculates the mean orientation of the fractures within each cluster and the dispersion or scatter among these fracture orientations. The technique is applied to the treatment of three examples. 81 refs  
DESCRIPTORS: \*ROCK MECHANICS, (GEOLOGY, Tectonics), STATISTICAL METHODS,  
IDENTIFIERS: ROCK FRACTURE ORIENTATIONS, ENGINEERING GEOLOGY  
CARD ALERT: 481, 502, 922

292755 ID NO - E1721014366  
**FATIGUE FAILURE AND FRACTOGRAPHY OF THE ROCK UNDER THE PULSATING TENSILE STRESS.**

Nishimatsu, Tuzichi; Hironoto, R.  
Univ of Tokyo, Jap  
Proc of 15th Jap Congr on Mater Res, Tokyo, Sep 1971 Soc Mater Sci Jap, 1972, p 141-144  
Fatigue failure of same rock under the pulsating tensile stress is reported. On the basis of the statistical analysis of the fluctuation of fatigue lives, the process of fatigue failure of the rock is suggested. In order to shed more light on the failure process of the rock, the fracture surfaces of the rock specimen are examined by electron fractographical techniques. 5 refs.  
DESCRIPTORS: \*ROCK MECHANICS.  
CARD ALERT 483, 502

281858 ID NO - E1721103858  
**WATER JET CUTTING OF SEDIMENTARY ROCK.**

Summers, David A.; Henry, Richard L.  
Univ of Missouri at Rolla  
JPT, J Pet Technol v 24 Jul 1972 p 797-802 CODEN: JPTUAM  
Depth and specific energy of breakage values are used to determine the relative efficiencies of cutting sandstone and limestone with a continuous jet of water. Results of using jet action alone compared with results obtained when mechanical breakage is also used to remove rock indicate the latter method is the more effective. A statistical analysis of data from the experiment provides a regression equation relating the properties of the jet to the cutting process. 11 refs.  
DESCRIPTORS: (\*ROCK DRILLING, \*Jet Method), ROCK MECHANICS, IDENTIFIERS, ROCK CUTTING  
CARD ALERT 405, 502

237263 ID NO - E172007263  
**Prognosis of small tectonic disturbances by means of analog probability methods**

LEVIN EM; MOZHEGOROV AS  
Tyumen Industrial Inst, Soviet Union  
Izv Vyssh Ucheb Zaved, Gorn Zh n 7 1971 p 1-9 CODEN: IVUUDA  
The intensity prediction of small tectonic disturbances, whose amplitude ranges from 0.1 to 2 yd, is considered in the course of the planning stage of mining shafts. Statistical data are presented and a model introduced. 7 refs. In Russian.  
DESCRIPTORS: \*ROCK MECHANICS,  
CARD ALERT 483, 502

235578 ID NO - E172015578  
**Statistical method for analysis of diffusion in soils**  
NAKANO Y; MURMANN RP

U.S. BUREAU OF MINING, PH  
SOIL Sci Soc Amer, Proc v 35 n 3 May-June 1971 p 397-402  
CODEN: SSSKAA

A statistical method for analysis of diffusion phenomena in soil for which the diffusion coefficient is time- and position dependent. The effect of the approach is demonstrated by application of the method in two exotic distributions in frozen soil is calculated. In the other case, the distribution of a volatile chemical is determined in two-layer profile. 20 refs.  
DESCRIPTORS: (\*SOILS, \*Frozen), SOIL MECHANICS, STATISTICAL METHODS,  
CARD ALERT 483, 922, 931

230668 ID NO - E172030668  
**Pillar strength prediction from representative sample of hard rock**  
KOSTAK B

Czechoslovak Acad of Sciences, Prague  
Int J Rock Mech Mining Sci v 8 n 5 Sept 1971 p 523-6  
CODEN: IJRMIA

Title method makes use of the cumulative distribution function of strength as of the basic characteristic of a heterogeneous rock. It is argued that a certain failure probability can be found that is supposed to be close to constant for various types of hard rock under standard loading conditions. From earlier experiments on feldspathic sandstone the probability was calculated as p equals ff. 5%. The strength related to this probability in the cumulative distribution function is the prediction of pillar strength for any particular rock. A representative sample of that rock must be obtained that would preserve defects in the correct proportion to the sound rock. 6 refs.  
DESCRIPTORS: (\*MINES AND MINING, \*Roof Supports), ROCK MECHANICS,  
CARD ALERT 502, 504, 505

222627 ID NO. - E172X02623  
**Proposed method to obtain actual strength parameters of mine rocks and rock masses**

CHIAN SSM  
 Univ of Idaho, Moscow  
 Int Soc Rock Mech, v 2, Proc 2nd Congr, Sept 21-26 1970, Belgrade, Yugoslavia, Theme 3, Pap 12, p 83-8  
 Published physical properties data of mine rocks predominantly refer to homogeneous samples. Only infrequently can the data be accepted as a true measure of the parent in-situ mass for design purpose. This paper describes a proposed method, using statistical and computer processing as aids, to determine strength parameters of actual mine rocks near mineralization zones. Rock types, mineral compositions and fabrics, fracturing conditions, as well as the loading directions are all being considered in this technique. 6 refs.

DESCRIPTORS: \*ROCK MECHANICS, STRENGTH OF MATERIALS.  
 CARD ALERT: 421, 422, 502

218935 ID NO. - E172X018935  
**Theory for the shear strength of rockf111**

WILKINS JK  
 HydroElectric Commission, Tasmania, Australia  
 Rock Mech, Felsmech, Mec Roches v 2 n 4 Dec 1970 p 205-22  
 Existing knowledge of the meaning of the shear strength of rock fill, and of how and why it varies is inadequate. Shear strength is shown to be controlled by the basic angle of friction of rock on rock, the voids ratio and the particle breakage and to be dependent on the ratio of major to minor principal stresses. Using statistical methods combined with some simple assumptions based on experimental work formulas are derived for the shear strength of rock fill. Theoretical results are compared with the results of laboratory triaxial tests. 10 refs.

DESCRIPTORS: (\*DAMS, EMBANKMENT, \*Stability), (DAMS, EMBANKMENT, Failure), SOIL MECHANICS, STATISTICAL METHODS.  
 CARD ALERT: 408, 441, 483, 922, 931

210314 ID NO. - E172X010314  
**Safety factors and the probability distribution of soil strength**

LUMB P  
 Univ of Hong Kong, China  
 Can Geotech J v 7 n 3 Aug 1970 p 225-42 CODEN: CGJGAA  
 For soils exhibiting both cohesive and frictional components of strength, the natural variabilities of the components are compared (or soil) in the undisturbed state and as compacting in each dam. The probability distributions of the components are shown to agree more closely with a theoretical beta distribution than with the commonly assumed normal distribution. The cohesive and frictional components can be regarded as independent variables and the design safety factor interpreted in terms of probabilities. The undrained strength

of clays also agrees with a beta distribution but in this case there are no limiting safety factors. 20 refs  
 DESCRIPTORS: (\*SOILS, \*Bearing Capacity), SOIL MECHANICS,  
 CARD ALERT: 421, 422, 483

154741 ID NO. - E171X054741  
**Numerical method for the analysis of finite beams on a statistically nonhomogeneous foundation**

IGNATOV VP; VERSHININ SA  
 Soil Mech Found Eng v 3 May-June 1970 p 162-6 CODEN SMFEA  
 Study described is devoted to method for analyzing finite beams on statistically nonhomogeneous foundations satisfying the Winkler bed hypothesis. The equilibrium equation for a beam subjected to a load of variable intensity is stated. The boundary conditions necessary for solving the case of a free beam of certain length are represented by a zero accidental cross-sectional moment and shear

DESCRIPTORS: \*BEAMS AND GIRDERS, FOUNDATIONS, SOIL MECHANICS

CARD ALERT: 405, 408, 483, 931

140723 ID NO. - E171X040723  
**Limit analysis of stability of slopes**

CHEN WF; GIGER WM  
 Lehigh Univ Bethlehem, Pa  
 ASCE J Soil Mech Found Div v 97 n SM1 Jan 1970 paper 7828 D 19-26 CODEN JSFEA

The upper bound theorem of limit analysis is applied to obtain complete numerical solutions for the critical height of slopes. A logarithmic spiral mechanism where the failure surface may pass below the toe is assumed. The analysis includes the existing limit equilibrium solutions as well as the previously obtained limit analysis solutions as a special case, and may be considered a generalization of all the previous solutions. The results found are practically identical to those obtained by the existing limit equilibrium procedures.

DESCRIPTORS: (\*SOIL MECHANICS, \*Stabilization), STATISTICAL METHODS, PLASTICITY, EMBANKMENTS,  
 IDENTIFIERS: SLOPES

CARD ALERT: 405, 421, 483, 922, 931

13940 ID NO - E171X03349  
**Number of test- pieces required to determine the strength of rock**  
YAMAGUCHI U  
Univ of Tokyo, Japan  
Int J Rock Mech Mining Sci v 7 n2 Mar 1970 p 209-27  
Studies to determine the number of test- pieces required to test strength of rock are reported. The number of test- pieces required is quantitatively decided by using a statistical technique. Decision of the sample number, experiments were carried out on three kinds of rock - granite, andesite, and sandy tuff, and measurements were made of the compressive and tensile (radial compression) strengths. As a general conclusion, it appears that 10 or more test pieces are required to determine the strength of rock, even if all the test pieces are prepared from the same block of the rock.  
DESCRIPTORS: \*ROCK MECHANICS, STRENGTH OF MATERIALS.  
CARD ALERT: 421, 422, 502

192410 ID NO - E171X002410  
**Improving fracture gradients estimates in offshore drilling**  
TAYLOR DR; SMITH TK  
Shell Oil Co, Metairie, LA  
Oil Gas J v 68 n 15 Apr 13 1970 p 67-72 CODEN OIGUA  
Optimum offshore drilling operations call for accurate estimates of formation fracture gradients, and theoretical predictions are often based on inadequate formation property data. Application of statistical analysis of injection tests carried out by Shell Oil Co in the normal pressured section of abandoned wells, resulted in logical casing programs and predictions of maximum allowable mud density. The density of the drilling fluid must be such that no lost circulation occurs due to hydraulic fracturing of the formation. Theory and analysis of empirical data is presented. 6 refs.  
DESCRIPTORS: \*OIL WELL DRILLING, \*Offshore), (OIL WELLS, Hydraulic Fracturing), ROCK MECHANICS.  
CARD ALERT: 502, 511, 512

132707 ID NO - E171X032707  
**Application of probability theory to factor of safety**  
KO KC; PIPER DA  
Trans Soc Mining Eng AIME v 247 n 3 Sept 1970 p 260-2  
The theory of probability with respect to the failure of structures is discussed. It is shown that the probability of safety, probability of failure, and factor of safety are directly related to each other and that as standard deviation approaches zero, the probability curves approach a unit step function which can be interpreted as the conventional factor of safety. 5 refs.  
DESCRIPTORS: \*ROCK MECHANICS, (MINES AND MINING, Rock Pressure), (GEOLOGY, Engineering), PROBABILITY.  
CARD ALERT 481, 502, 504, 505, 932

101154 ID NO - E171X001154  
**Statistical distribution of fatigue life and the fracture mechanism of the rock**  
NISHIMATSU Y; HERDESEWUJO R  
Univ of Tokyo, Japan  
Proc 13th Jap Congr on Mater Res, Tokyo, Japan, Sept 1969 p 203-6  
Paper reports the test results on the fatigue failure of the rock under the pulsating compressive stress. Standing on the aspect in which the fatigue failure is assumed as a stochastic process, the observed fluctuation of the fatigue life is discussed. Based on this discussion, the mechanism of the fatigue failure of the rock would be suggested. 5 refs.  
DESCRIPTORS: \*ROCK MECHANICS, (MATERIALS TESTING, Fracture), (MATERIALS TESTING, Fatigue).  
CARD ALERT: 421, 483, 502

125819 ID NO - E171X025819  
**Frequency and apertures of fractures in rock**  
SNOW DT  
Colorado School of Mines, Golden  
Int J Rock Mech Mining Sci v 7 n 1 Jan 1970 p 23-40, 2  
plates CODEN: IJRM  
Pressure- test data have been used to estimate the average spacing and the average aperture of waterconducting fractures in undisturbed rock masses. The discharge of water injection tests in jointed crystalline foundation rocks lend themselves to statistical interpretation leading to estimates of the spatial frequency of joints, and the mean and variance of the size distributions of fracture apertures, which are lognormal. 28 refs.  
DESCRIPTORS: \*PETROLOGY, ROCK MECHANICS, (FLOW OF FLUIDS, Capillaries).  
CARD ALERT 482, 502, 631

132707 ID NO - E171X032707  
**Application of probability theory to factor of safety**  
KO KC; PIPER DA  
Trans Soc Mining Eng AIME v 247 n 3 Sept 1970 p 260-2  
The theory of probability with respect to the failure of structures is discussed. It is shown that the probability of safety, probability of failure, and factor of safety are directly related to each other and that as standard deviation approaches zero, the probability curves approach a unit step function which can be interpreted as the conventional factor of safety. 5 refs.  
DESCRIPTORS: \*ROCK MECHANICS, (MINES AND MINING, Rock Pressure), (GEOLOGY, Engineering), PROBABILITY.  
CARD ALERT 481, 502, 504, 505, 932

052566 ID NO. - E170152566  
Statistical theory of brittle fracture for rock materials- 2  
BRADY BT  
Colorado School of Mines, Golden  
Int J Rock Mechanics & Min Sciences v 6 n 3 May 1969 p  
285-300  
Brittle failure under homogenous triaxial states of stress.  
Critical volumetric microcrack strain criterion outlined in pt  
1 (indexed elsewhere) is extended to include total failure of  
brittle materials deformed under condition of homogenous  
triaxial loading; it is shown that criterion indicates  
fracturing characteristics of brittle rock materials are  
influenced by value of intermediate stress. 10 refs.  
DESCRIPTORS: \*ROCK MECHANICS.  
CARD ALERT: 502

051952 ID NO. - E170151952  
Apparatus and techniques for rationalization of structural  
statistical data in tectonic and rock mechanical  
investigations. (Einige Geräte und Techniken fuer die  
Rationalisierung geostatistischer Arbeiten bei tektonisch-  
en und felsmechanischen Untersuchungen)  
BEHR WJ  
Bergakademie Freiberg, East Germany  
Rock Mechanics Feismechanik-Mecanique des Roches v 1 n 2-3  
Oct 1969 p 157-64  
For compass measurement a field recording device is used,  
with which punch diagrams are made. A semiautomatic universal  
stage enables th automatic recording of microscopic fabric  
measurements which are also recorded by punch diagrams. These  
diagrams are transformed into contour diagrams by a  
photomechanical procedure. In German.  
DESCRIPTORS: \*ROCK MECHANICS.  
CARD ALERT: 502

043621 ID NO. - E170143621  
Decision theory applied to settlement predictions  
ROLAYAN JI; HOEG K; BENJAMIN JR  
Dames and Moore, San Francisco, Calif  
ASCE J Soil Mech Found Div v 96 n 5M4 July 1970 paper 7390 p  
1127-41  
New application of theory of probability permits a rational  
approach to an evaluation of the meaning of '%safety  
factors', as used in soil mechanics. The Bayesian approach  
shows how the reliability of an engineering analysis depends  
on the amount and nature of the engineer's previous  
experience. Statistical decision theory is applied to  
determine a course of action which is logically consistent  
with the decision-maker's preferences. A case study is  
examined involving settlements of reclaimed marshland. 14  
refs.  
DESCRIPTORS: \*PROBABILITY, SOIL MECHANICS, (FOUNDATIONS,  
Settlement), STATISTICAL METHODS.  
CARD ALERT: 405, 483, 922

038146 ID NO. - E1701038146  
Safety analysis of slopes  
WU FH; KRAFT JR LM  
Ohio State Univ, Columbus  
ASCE J Soil Mech Found Div v 96 n 5M2 Mar 1970 paper 7174 p  
609-30  
The various uncertainties and errors are used to compute the  
failure probability of slopes designed according to the  
conventional practice. Statistical decision theory is used to  
obtain the optimum safety factor and the expected cost. The  
results also show the effect of uncertainties on the optimum  
design and the expected cost. The study illustrates one  
approach in the application of research results to practice  
and the evaluation of benefits gained from research. 40 refs.  
DESCRIPTORS: \*SOIL MECHANICS, STRENGTH OF MATERIALS,  
STATISTICAL METHODS, (STRUCTURAL DESIGN, Safety Factor),  
IDENTIFIERS: SLOPE PROTECTION  
CARD ALERT: 408, 421, 422, 483, 914

023370 ID NO. - E1701023370  
Estimation of climatic parameters for frost depth prediction  
MOULTON LK; SCHAUB JH  
West Virginia Univ, Morgantown  
ASCE-Proc v 95 (Transportation Eng J) n 1E4 Nov 1969 paper  
6872 p 605-16  
A method for estimating air freezing index, duration of  
freeze, and mean annual temperature used in West Virginia. A  
statistical study was made to relate air freezing index,  
duration of freeze and mean annual temperature to the  
elevations and latitudes of the weather stations studied and  
to permit consideration of any given return period or  
recurrence interval for design. It is proposed that the  
recurrence interval for pavement design purposes be chosen to  
be equal to the design life of the pavement. 9 refs. 1  
DESCRIPTORS: (\*ROADS AND STREETS, \*Frost Effect), (ROADS AND  
STREETS, Temperature MEASUREMENT), SOIL MECHANICS,  
IDENTIFIERS: PAVEMENTS  
CARD ALERT: 406, 483

013587 ID NO - E1701003587  
On coefficient of static earth pressure of noncohesive soils. (Ein Beitrag um RBIVRT KOKAESTONSLÖSER Boden)  
SCHOEN J  
Bergbautechnik v 18 n 11 Nov 1968 p 558-60  
for statistically defined soil model tensor of elasticity and coefficient of earth pressure at rest, which can immediately be indicated as dependent on porosity, are calculated by means of structural parameters (angle of contact between particles and number of points of contact); soil model shows phenomenon of %elastic hysteresis %; (coefficient of earth pressure at rest depending on stress in case of decompression) 8 refs In German  
DESCRIPTORS: \*SOIL MECHANICS, LIGNITE MINES AND MINING.  
CARD ALERT: 035, 129

011468 ID NO - E1701011468  
Influence of random Poisson's ratio on displacements in elastic half-plane  
BARGMANN H; GILJECKI J  
Technische Hochschule, Vienna, Austria  
Int J Solids & Structures v 5 n 9 Sept 1969 p 915-20  
Displacement boundary problems are considered for homogeneous isotropic elastic half-plane with random Poisson's ratio v. Probability densities, expected values and variances of displacement field are determined and evaluated for uniform probability distribution of v; as example, effect of discontinuity of boundary vertical displacement is determined and used to obtain settlement of earth surface under coal excavation  
DESCRIPTORS: (COAL MINES AND MINING, \*Rock Pressure), ROCK MECHANICS, STRESSES, ELASTICITY.  
CARD ALERT: 035, 075, 128, 129, 200

013579 ID NO - E1701013579  
Spectral simulation and earthquake site properties  
LIU SC; JHAVERI DP  
Bell Telephone Labs, Whippany, NJ  
ASCE Proc v 95 (J Eng Mechanics Div) n EMS Oct 1969 paper 6848 p 1145-68  
Analytic results of study on site properties and their use in ground motion prediction and simulation; spectral simulations of random ground motions based on modal contributions are formulated; linear filters representing ground transfer characteristics of seismic stations are investigated; single-mode and two-mode stochastic models are developed to permit prediction of random-type ground motions and induced response statistics of structures.  
DESCRIPTORS: (SEISMIC DESIGN, \*Earthquake Resistance), EARTHQUAKES, SOIL MECHANICS.  
CARD ALERT: 032, 192, 200

013587 ID NO - E1701003587  
On coefficient of static earth pressure of noncohesive soils. (Ein Beitrag um RBIVRT KOKAESTONSLÖSER Boden)  
SCHOEN J  
Bergbautechnik v 18 n 11 Nov 1968 p 558-60  
for statistically defined soil model tensor of elasticity and coefficient of earth pressure at rest, which can immediately be indicated as dependent on porosity, are calculated by means of structural parameters (angle of contact between particles and number of points of contact); soil model shows phenomenon of %elastic hysteresis %; (coefficient of earth pressure at rest depending on stress in case of decompression) 8 refs In German  
DESCRIPTORS: \*SOIL MECHANICS, LIGNITE MINES AND MINING.  
CARD ALERT: 035, 129

013579 ID NO - E1701013579  
Spectral simulation and earthquake site properties  
LIU SC; JHAVERI DP  
Bell Telephone Labs, Whippany, NJ  
ASCE Proc v 95 (J Eng Mechanics Div) n EMS Oct 1969 paper 6848 p 1145-68  
Analytic results of study on site properties and their use in ground motion prediction and simulation; spectral simulations of random ground motions based on modal contributions are formulated; linear filters representing ground transfer characteristics of seismic stations are investigated; single-mode and two-mode stochastic models are developed to permit prediction of random-type ground motions and induced response statistics of structures.  
DESCRIPTORS: (SEISMIC DESIGN, \*Earthquake Resistance), EARTHQUAKES, SOIL MECHANICS.  
CARD ALERT: 032, 192, 200

013587 ID NO - E1701003587  
On coefficient of static earth pressure of noncohesive soils. (Ein Beitrag um RBIVRT KOKAESTONSLÖSER Boden)  
SCHOEN J  
Bergbautechnik v 18 n 11 Nov 1968 p 558-60  
for statistically defined soil model tensor of elasticity and coefficient of earth pressure at rest, which can immediately be indicated as dependent on porosity, are calculated by means of structural parameters (angle of contact between particles and number of points of contact); soil model shows phenomenon of %elastic hysteresis %; (coefficient of earth pressure at rest depending on stress in case of decompression) 8 refs In German  
DESCRIPTORS: \*SOIL MECHANICS, LIGNITE MINES AND MINING.  
CARD ALERT: 035, 129

013587 ID NO - E1701003587  
On coefficient of static earth pressure of noncohesive soils. (Ein Beitrag um RBIVRT KOKAESTONSLÖSER Boden)  
SCHOEN J  
Bergbautechnik v 18 n 11 Nov 1968 p 558-60  
for statistically defined soil model tensor of elasticity and coefficient of earth pressure at rest, which can immediately be indicated as dependent on porosity, are calculated by means of structural parameters (angle of contact between particles and number of points of contact); soil model shows phenomenon of %elastic hysteresis %; (coefficient of earth pressure at rest depending on stress in case of decompression) 8 refs In German  
DESCRIPTORS: \*SOIL MECHANICS, LIGNITE MINES AND MINING.  
CARD ALERT: 035, 129

013587 ID NO - E1701003587  
On coefficient of static earth pressure of noncohesive soils. (Ein Beitrag um RBIVRT KOKAESTONSLÖSER Boden)  
SCHOEN J  
Bergbautechnik v 18 n 11 Nov 1968 p 558-60  
for statistically defined soil model tensor of elasticity and coefficient of earth pressure at rest, which can immediately be indicated as dependent on porosity, are calculated by means of structural parameters (angle of contact between particles and number of points of contact); soil model shows phenomenon of %elastic hysteresis %; (coefficient of earth pressure at rest depending on stress in case of decompression) 8 refs In German  
DESCRIPTORS: \*SOIL MECHANICS, LIGNITE MINES AND MINING.  
CARD ALERT: 035, 129

013587 ID NO - E1701003587  
On coefficient of static earth pressure of noncohesive soils. (Ein Beitrag um RBIVRT KOKAESTONSLÖSER Boden)  
SCHOEN J  
Bergbautechnik v 18 n 11 Nov 1968 p 558-60  
for statistically defined soil model tensor of elasticity and coefficient of earth pressure at rest, which can immediately be indicated as dependent on porosity, are calculated by means of structural parameters (angle of contact between particles and number of points of contact); soil model shows phenomenon of %elastic hysteresis %; (coefficient of earth pressure at rest depending on stress in case of decompression) 8 refs In German  
DESCRIPTORS: \*SOIL MECHANICS, LIGNITE MINES AND MINING.  
CARD ALERT: 035, 129

013587 ID NO - E1701003587  
On coefficient of static earth pressure of noncohesive soils. (Ein Beitrag um RBIVRT KOKAESTONSLÖSER Boden)  
SCHOEN J  
Bergbautechnik v 18 n 11 Nov 1968 p 558-60  
for statistically defined soil model tensor of elasticity and coefficient of earth pressure at rest, which can immediately be indicated as dependent on porosity, are calculated by means of structural parameters (angle of contact between particles and number of points of contact); soil model shows phenomenon of %elastic hysteresis %; (coefficient of earth pressure at rest depending on stress in case of decompression) 8 refs In German  
DESCRIPTORS: \*SOIL MECHANICS, LIGNITE MINES AND MINING.  
CARD ALERT: 035, 129

APPENDIX E: GEOARCHIVE (FILE 55)

PLATE 7 3/1-44  
 DIAGONAL STRIP METHOD FOR THE ANALYSIS OF THE STRESS DISTRIBUTION IN A PLATE WITH A CRACK  
 1981 44 31100 31200 31300 31400 31500 31600 31700 31800 31900 32000

SOILS  
 681100000000  
**Some multivariate probabilistic techniques in geotechnical engineering**  
 HASOFFER, AM  
 Math Sci (Mathematics) 7 4 P.15-24 1981 JRNL CODE 160742  
 LANGUAGE ENGLISH  
 DESCRIPTORS: MULTIVARIATE STATISTICS; PROBABILITY  
 ENGINEERING GEOLOGY  
 DESCRIPTOR CODES 692200; 691000; 362000

700804 GA610000066  
**Probabilistic soil exploration case history**  
 WU, TH; WONG, K  
 J Geotech Eng Div Proc Am Soc Civ Eng (New York) 10/2/82  
 P1693 1711 1981 JRNL CODE 365881  
 LANGUAGE ENGLISH  
 DESCRIPTORS: SOIL ANALYSIS; SOIL MECHANICS; PROBABILITY  
 DESCRIPTOR CODES 336100; 362000; 691000

700641 GA69000873  
**Statistical estimation of compression index**  
 KOPMILA, SD  
 Geotech Test J (Philadelphia) 4 2 P.63-69 104 1981 JRNL  
 CODE 690001  
 LANGUAGE ENGLISH  
 DESCRIPTORS: PEDOLOGICAL FIELD METHODS; STATISTICAL ANALYSIS;  
 SOIL MECHANICS  
 DESCRIPTOR CODES 741000; 816000; 692000; 362000

688542 GA593000328  
**Statistical analysis of sand liquefaction**  
 FARDIS, MN; VENTURATO, D  
 J Geotech Eng Div Proc Am Soc Civ Eng (New York) 10/2/82  
 P1361 1377 1981 JRNL CODE 365881  
 LANGUAGE ENGLISH  
 DESCRIPTORS: ENGINEERING PROPERTIES OF SOIL; EARTHQUAKE  
 ENGINEERING; SITE INVESTIGATIONS; EXPERIMENTAL SOIL MECHANICS  
 DESCRIPTOR CODES 362100; 362000; 360100; 362600

688421 GA593000207  
**Recovery correlations for in-situ combustion field projects and application to combustion pilots**  
 RICHMAN, WF; SATMAN, A; SULLIVAN, MY  
 J Pet Technol (Dallas) 12/12 P.2132 2138 1980 JRNL CODE  
 JPTFC1  
 LANGUAGE ENGLISH  
 DESCRIPTORS: OIL FIELD APPRAISAL & DEVELOPMENT; TERTIARY  
 RECOVERY; PETROLEUM RESEARCH STUDIES; STATISTICAL ANALYSIS;  
 ENGINEERING GEOLOGY

687336 GASR000878  
**Lithofacies correlation and soil-mechanical properties of coastal Holocene sediments from the southern North Sea with multivariate statistical methods**  
 LINDENER, T  
 Arch Geol Wiss Abh Reihe A Geol Palaeontol (Berlin) 31 88P  
 1980 JRNL CODE 8GARA1  
 LANGUAGE GERMAN  
 DESCRIPTORS: SEDIMENTOLOGY; MULTIVARIATE STATISTICS; SOIL  
 MECHANICS; LITHOSTRATIGRAPHY; STRATIGRAPHICAL CORRELATION  
 AUXILIARY DESCRIPTORS: SOUTHERN NORTH SEA BASIN; HOLOCENE;  
 COASTAL AREAS  
 DESCRIPTOR CODES 550000; 692200; 362000; 763000; 762400  
 AUXILIARY DESCRIPTOR CODES 138800; 099000; 006000

678527 GAS585000373  
**Probability theory in geotechnics - an introduction**  
 SMITH, GN  
 Ground Eng (Brentwood) 14/7 P.29 34 1981 JRNL CODE: GENG11  
 LANGUAGE ENGLISH  
 DESCRIPTORS: ENGINEERING GEOLOGY; PROBABILITY; STATISTICAL  
 ESTIMATION; ENGINEERING PROPERTIES OF SOIL; SOIL MECHANICS  
 DESCRIPTOR CODES 360000; 691000; 691300; 362100; 362000

677171 GA584000359  
**Statistical reproducibility of the dynamic and static fatigue experiments**  
 RITTER, JE; BANOVODIIVAY, N; JAKUS, K  
 Bull Am Ceram Soc (Columbus) 60/B P198 806 1981 JRNL  
 CODE BACSOI  
 LANGUAGE ENGLISH  
 DESCRIPTORS EXPERIMENTAL SOIL MECHANICS; SAMPLING;  
 CONSTRUCTION MATERIALS; STATISTICAL ANALYSIS; MINE PRODUCTION;  
 LINEAR REGRESSION  
 DESCRIPTOR CODES 362600; 691200; 451000; 692000; 346200;  
 694100

677116 GA584000344  
**Partial coefficient design in geotechnics**  
 SEMPLE, RM  
 Ground Eng (Brentwood) 14/6 P47-48 1981 JRNL CODE GENGI1  
 LANGUAGE ENGLISH  
 DESCRIPTORS ENGINEERING GEOLOGY; STATISTICAL ANALYSIS  
 DESCRIPTOR CODES 360000; 692000

670376 GA580000276  
**Probabilistic modeling of uncertainties in sampling and testing for undrained strength**  
 KURODA, K; CHODHURY, R; WATANABE, K  
 Soils Found (Tokyo) 21/2 P47-62 1981 JRNL CODE SFOUNT  
 LANGUAGE ENGLISH  
 DESCRIPTORS FOUNDATION ENGINEERING; ROCK MECHANICS;  
 PROBABILITY  
 DESCRIPTOR CODES 360200; 365000; 691000

658966 GA573000367  
**Site dependent spectra for aseismic design**  
 KHANNA, R; PAUL, DK; CHANDRA, B  
 Bull Indian Soc Earthquake Technol (Roorkee) 14/3 P83 10-1  
 1977 JRNL CODE BISETI  
 LANGUAGE ENGLISH  
 DESCRIPTORS EARTHQUAKE ENGINEERING; ROCK MECHANICS; SOIL  
 MECHANICS; STATISTICAL ANALYSIS  
 DESCRIPTOR CODES 367000; 365000; 362000; 692000

632954 GA547000529  
**Investigation of Egypt's Abu Tartur phosphate deposit**  
 Phosphorus Potassium (London) 109 P37-6 1980 JRNL CODE  
 PPOTAI  
 LANGUAGE ENGLISH  
 DESCRIPTORS PHOSPHATE DEPOSITS; MINERAL PRODUCTION  
 STATISTICS; GEOCHEMISTRY OF MINERAL DEPOSITS; LITHOSTRATIGRAPHY;  
 ROCK MECHANICS  
 AUXILIARY DESCRIPTORS EGYPT

DESCRIPTOR CODES 467000; 359100; 669000; 763000; 365000  
 AUXILIARY DESCRIPTOR CODES 610000

629462 GA543000402  
**Mathematical-statistical connections between rock-mechanical and rock-physical parameters**  
 HEINE, KH  
 Z Angew Geol (Berlin) 26/10 P519-523 1980 JRNL CODE ZANGEO1  
 LANGUAGE GERMAN  
 DESCRIPTORS ROCK MECHANICS; PHYSICAL PROPERTIES OF ROCKS;  
 STATISTICAL ANALYSIS; NUMERICAL ANALYSIS  
 DESCRIPTOR CODES 365000; 540300; 692000; 696000

619052 GA534000736  
**Statistical study of results of laboratory geotechnical tests on the clays of Flandres (north France)**  
 DEPREZ, D; VERRET, J  
 Int Geol Congr (Paris) CONF. DATES 07 JULY TO 17 JULY 1980  
 NO 80 0001  
 P1187 1980  
 LANGUAGE FRENCH  
 DESCRIPTORS EXPERIMENTAL ROCK MECHANICS; CLAYS; STATISTICAL  
 ANALYSIS; STRUCTURAL GEOLOGY  
 AUXILIARY DESCRIPTORS FRANCE  
 DESCRIPTOR CODES 365600; 553700; 692000; 730000  
 AUXILIARY DESCRIPTOR CODES 210000

617400 GA532000169  
**Probabilistic evaluation of penetration resistance**  
 LANG, WH  
 Publ Nor Geotek Inst (Oslo) 131 19P 1980 JRNL CODE  
 PRNIN1  
 LANGUAGE ENGLISH  
 DESCRIPTORS FOUNDATION ENGINEERING; PETROLEUM PRODUCTION  
 OPERATIONS; SOIL MECHANICS; SOIL PHYSICS; ROCK MECHANICS;  
 PROBABILITY  
 AUXILIARY DESCRIPTORS NORTH SEA  
 DESCRIPTOR CODES 360200; 343600; 362000; 741600; 365000;  
 694100  
 AUXILIARY DESCRIPTOR CODES 138000

17 of 44) User 5208 15sep82 2231  
 DESCRIPTOR CODES 491400; 491800; 691300; 360000  
 561245 GA476000352  
**Analysis of large-panel buildings on statistically heterogeneous four dation beds**  
 MIKHEEV, VV; PYRKIN, GB; SHEININ, VI  
 Soil Mech Found Eng (New York) 12/2 P115-119 1975 URNL  
 CODE SMFENH  
 LANGUAGE ENGLISH  
 DESCRIPTORS SOIL MECHANICS  
 DESCRIPTOR CODES 362000

514842 GA436000398  
**Attempt at a geotechnical assessment of the geological map of the interesting zone by a direct scheme of urban management (SDAU) of Toulouse**  
 VIDAL-FONT, M; GAIHARAGUE, J; LOISEAU, H  
 Resume Princ Results Sci Tech Serv Geol Natl (Paris) 1977 P166  
 RPRSTI  
 LANGUAGE FRENCH  
 DESCRIPTORS ENGINEERING GEOLOGY; GEOLOGICAL MAPPING; PETROLEUM PRODUCTION STATISTICS  
 AUXILIARY DESCRIPTORS MIDI-PYRENEES REGION  
 DESCRIPTOR CODES 360000; 322200; 353600  
 AUXILIARY DESCRIPTOR CODES 238000

504351 GA428000359  
**Statistical variation in stress-volumetric strain behavior of Westerly granite**  
 COSTANTINO, MS  
 Int J Rock Mech Min Sci Gemmech Abstr (Oxford) 1978  
 15/3 P105-111  
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 LANGUAGE ENGLISH  
 DESCRIPTORS ROCK ENGINEERING PROPERTIES; EXPERIMENTAL ROCK MECHANICS; STATISTICAL ANALYSIS; GRANITES & ADAMELLITES  
 DESCRIPTOR CODES 365100; 365600; 692000; 543100

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 DESCRIPTOR CODES 491400; 491800; 691300; 360000  
 561245 GA476000352  
**Probabilistic evaluation of safety of soil structures**  
 ALIABADI, FARID P  
 Proc Inst Civ Eng (New York) 105/49  
 P1045-1054 URNL CODE 664101  
 LANGUAGE ENGLISH  
 DESCRIPTORS EARTHWORKS; SOIL MECHANICS; PROBABILITY  
 DESCRIPTOR CODES 364000; 362000; 691000

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**Statistical study of rock drilling by hypervelocity jets from explosi ve shaped charges**  
 BOLENS, RR; CLARK, GB; BROWN, JW  
 CONF DATES 01 SEPTEMBER TO 07 SEPTEMBER 1974 NO: 74-0002  
 Adv Rock Mech (Washington DC) 2B P1384-1391 1974 URNL  
 CODE ARMECI  
 LANGUAGE ENGLISH  
 DESCRIPTORS ROCK MECHANICS; STATISTICAL ANALYSIS  
 DESCRIPTOR CODES 365000; 692000

GA488001083  
**Statistical theory of fragmentation**  
 DIERKS, K  
 Gev Rep Annuaire IUTIS Springfield Va 22161 LA UR-786P  
 1976 URNL CODE 4GRAN  
 LANGUAGE ENGLISH  
 DESCRIPTORS ROCK MECHANICS; GEOMATHEMATICS  
 DESCRIPTOR CODES 365000; 690000

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 WIAK, T  
 Bull Geol (Warsaw) 15 P257-310 1973 URNL CODE 66WUNI  
 LANGUAGE POLISH  
 DESCRIPTORS ENGINEERING GEOLOGY; PALEOGEO MORPHOLOGY; STATISTICAL ANALYSIS; SUBSURFACE MAPPING  
 AUXILIARY DESCRIPTORS POLAND; PLEISTOCENE  
 DESCRIPTOR CODES 360000; 771500; 692000; 322400  
 AUXILIARY DESCRIPTOR CODES 136000; 091000

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 GRIFFIS, G  
 Proc Inst Civ Eng Part 2 Res Theory (London) 67/3 P841-844  
 1979 URNL CODE 6ICEPI  
 LANGUAGE ENGLISH  
 DESCRIPTORS RIVER DYNAMICS; FLOODS; STATISTICAL ESTIMATION; HYDROLOGICAL GEOLOGY

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for determining elastic moduli  
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Geol. Rep. Am. Geophys. Union, Springfield Va 22161  
1974  
PB 231 129P  
\*GPN  
LANGUAGE ENGLISH  
DESCRIPTORS ROCK MECHANICS; MARBLES; GRANDDIOPTITES;  
STATISTICAL ANALYSIS  
DESCRIPTOR CODES 365000; 549800; 543200; 692000
- 474643 GA384002506  
The value of Poisson's ratio in saturated soils and rocks  
stressed under undrained conditions  
BISHOP, AW; HIGHT, DW  
Geotechnique (London)  
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27/3 P369-394  
GOTET  
LANGUAGE ENGLISH  
DESCRIPTORS SOIL MECHANICS; ROCK MECHANICS; STATISTICAL  
ANALYSIS  
DESCRIPTOR CODES 362000; 365000; 692000
- 468572 GA384001177  
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TLERNAN, M; WARREN, N  
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58/6 P500  
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LANGUAGE CONFERENCE ABSTRACT  
DESCRIPTORS FRACTURES; STATISTICAL ANALYSIS; EXPERIMENTAL  
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DESCRIPTOR CODES 733200; 692000; 365600
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PARRISH, DK; GARGI, AF  
CONF. DATES 30 MAY TO 03 JUNE NO. 77 0065  
EOS, Trans. Am. Geophys. Union (Washington DC)  
1977  
58/6 P514  
FAGUI  
LANGUAGE CONFERENCE ABSTRACT  
DESCRIPTORS ROCK MECHANICS; LABORATORY METHODS; STATISTICAL  
ANALYSIS; DEFORMATION  
DESCRIPTOR CODES 365000; 820000; 692000; 731100
- 474192 GA384000447  
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19/5 P131-134  
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LANGUAGE CZECH  
DESCRIPTORS ROCK MECHANICS; GRAPHICAL METHODS; FAULTING  
DESCRIPTOR CODES 365000; 840000; 731600
- 456614 GA375000430  
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BARTON, CM  
Lect. Serv. Div. Appl. Geomech. CSIRO (MT. Waverly)  
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LANGUAGE ENGLISH  
DESCRIPTORS ENGINEERING GEOLOGY; PHYSICAL PROPERTIES OF  
ROCKS; STATISTICAL ANALYSIS  
DESCRIPTOR CODES 360000; 540300; 692000
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Proc. 3 Congr. ISRM (Denver) CONF. DATES: 01 SEPTEMBER TO 07  
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LANGUAGE CONFERENCE PROCEEDINGS  
DESCRIPTORS ROCK ENGINEERING PROPERTIES; STATISTICAL  
ANALYSIS; EXPERIMENTAL ROCK MECHANICS  
DESCRIPTOR CODES 365100; 692000; 365600

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102-7 P816  
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LANGUAGE ENGLISH  
DESCRIPTORS EARTHWORKS. STATISTICAL ANALYSIS. SOIL MECHANICS  
AUXILIARY DESCRIPTORS GREECE  
DESCRIPTOR CODES 360400, 692000, 362000  
AUXILIARY DESCRIPTOR CODES 356000

412284 GA324003927  
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102-7 P815  
JGEDPH  
LANGUAGE ENGLISH  
DESCRIPTORS EARTHWORKS. STATISTICAL ANALYSIS. SOIL MECHANICS  
AUXILIARY DESCRIPTORS GREECE  
DESCRIPTOR CODES 360400, 692000, 362000  
AUXILIARY DESCRIPTOR CODES 356000

405656 GA320001423  
Statistics of liquefaction and SPT results

1975  
J Geotech Eng Div Proc Am Soc Civ Eng (New York)  
101/9 P1135-1150  
JGEDPH  
LANGUAGE ENGLISH  
DESCRIPTORS SOIL ENGINEERING PROBLEMS. STATISTICAL ANALYSIS  
EXPERIMENTAL SOIL MECHANICS. EARTHQUAKE ENGINEERING  
DESCRIPTOR CODES 362000, 692000, 362600, 367000

405678 GA320001405  
Statistical quality control at Kastraki Earth Dam (Greece)

1975  
J Geotech Eng Div Proc Am Soc Civ Eng (New York)  
101/9 P817-851  
JGEDPH  
LANGUAGE ENGLISH

Investigation of rocks by mathematical statistical methods

1975  
GARIPOV, VV  
LANGUAGE RUSSIAN  
NOTES BOOKS  
DESCRIPTORS BOOKS. STATISTICAL ANALYSIS. ROCK MECHANICS  
DESCRIPTOR CODES 140000, 632000, 365000

373716 GA295001918  
Multivariate statistical analysis in engineering geology

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KOMAROV, IS; KHAJIME, NM; BARENYSHEV, AP  
LANGUAGE RUSSIAN  
NOTES FORTHCOMING BOOKS  
DESCRIPTORS FORTHCOMING BOOKS. ENGINEERING GEOLOGY  
MULTIVARIATE STATISTICS  
DESCRIPTOR CODES 131000, 360000, 692200

361007 GA287000414  
A method for the application of soil mechanics to non-homogeneous soils

1975  
MCANALLY, PA  
2 Aust NZ Conf Geomech (Brisbane) CONF. DATES 21 JULY TO 25 JULY NO 75-0064  
126-30  
LANGUAGE CONFERENCE PREPRINT  
DESCRIPTORS SOIL MECHANICS. SITE INVESTIGATIONS  
STATISTICAL ANALYSIS  
DESCRIPTOR CODES 362000, 360100, 692000

364211 GA229004847  
 Comprehensive dissertation index supplement 1973, volume 2  
 (of 5) Sciences (astronomy, engineering, geology, mathematics  
 and statistics, physics)  
 LANGUAGE ENGLISH  
 NOTES BOOKS-  
 DESCRIPTORS BOOKS; GUIDES TO THESES  
 DESCRIPTOR CODES 130000; 911900

354125 GA269004847  
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 properties of acentinuous medium  
 KOZNETSOV, AP  
 Sov Min Sci (New York)  
 1973  
 9/5 P573-575  
 SMSCI  
 LANGUAGE ENGLISH  
 DESCRIPTORS EXPERIMENTAL ROCK MECHANICS  
 DESCRIPTOR CODES 365600

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 Application of statistics in soil mechanics (In LEE, IK (Ed)  
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 LUMB, P  
 1974  
 P44-111  
 LANGUAGE ENGLISH  
 DESCRIPTORS SOIL MECHANICS; GEOMATHEMATICS  
 DESCRIPTOR CODES 362000; 690000

322086 GA241001346  
 Guide to the application of statistical analysis of  
 experimental data in the study of the properties of rocks and  
 their diintegration processes  
 MIRZADZHANZAD/ AK; AGAEV, SG; ALIMAMEDOV, AF  
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 98P  
 LANGUAGE RUSSIAN  
 NOTES BOOKS-  
 DESCRIPTORS BOOKS; SAMPLING; STATISTICAL ANALYSIS, ROCK  
 MECHANICS  
 DESCRIPTOR CODES 130000; 691200; 692000; 365000

315683 GA233004297  
 Probability of earthquake occurrence estimated from results  
 of rock fracture experiments  
 HAJIWARA, Y  
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310862 GA229003673  
 Simplified procedures for the vector summation and  
 statistical analysis of spherically distributed point clusters  
 BARTON, CM  
 Tech Rep Div Appl Geomech CSIRO Aust (Mount Waver  
 1974  
 20 24P  
 TRDAG  
 LANGUAGE ENGLISH  
 DESCRIPTORS STATISTICAL ANALYSIS, ENGINEERING GEOLOGY  
 DESCRIPTOR CODES 682400; 365600

310862 GA229003673  
 Simplified procedures for the vector summation and  
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 BARTON, CM  
 Tech Rep Div Appl Geomech CSIRO Aust (Mount Waver  
 1974  
 20 24P  
 TRDAG  
 LANGUAGE ENGLISH  
 DESCRIPTORS STATISTICAL ANALYSIS, ENGINEERING GEOLOGY  
 DESCRIPTOR CODES 682400; 365600

APPENDIX F: GPO MONTHLY CATALOGUE (FILE 66)

Print 2 5 1  
DIAID, Filing 610 Monthly Catalog - Jul 1976 to Jun 1982 (Item 1 of 1) User 5708 1sep82

8014841 1 28 23-8414  
**Least squares calculation of horizontal stresses from more than three diametral deformations in vertical boreholes**  
 Duval, Wilbur I ; Agoston, James R  
 United States : Bureau of Mines (Washington) : Dept. of the Interior, Bureau of Mines 1980  
 1 p. 1979 : 12 p. : 27 cm.  
 Report of investigations - Bureau of Mines ; B414  
 LCCN 79607970  
 LC: TN23 U43 no. B414.; TA70 DENEY 622/.08 ; 624/.1513  
 Bibliography p. 12  
 Descriptors: Rock mechanics--Statistical methods ; Least squares ; Boring ;

APPENDIX G: GEOREF (FILE 89)

1126911 82-45645  
**Deformation restraint and the mechanics of soil behavior**  
Pitt, J. M.  
Iowa State Univ., Ames, IA, USA  
204p., 1981  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: \*foundations; \*soil mechanics; \*deformation;  
settlement; theoretical studies; bearing capacity; stress;  
strain; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1126906 82-45639  
**Plasticity modeling of soils and finite element applications**  
Mizuno, E.  
Purdue Univ., West Lafayette, IN, USA  
237p., 1981  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: \*soil mechanics; \*deformation; \*automatic data  
processing; theoretical studies; engineering geology;  
plasticity; finite element analysis; statistical methods;  
mathematical models; models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1126897 82-45619  
**Three-dimensional stability analysis**  
Chen, R. J.  
Purdue Univ., West Lafayette, IN, USA  
223p., 1981  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: \*slope stability; \*automatic data processing;  
theoretical studies; engineering geology; finite element  
analysis; statistical methods; computer programs; FESPDN;  
three-dimensional models; models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1126812 82-45486  
**Stochastic trigger model for flood peaks; 2. Application of  
the model to the flood peaks of Goksu-Karahacilli**  
Kavas, M. L.  
Univ. Ky., Dep. Civ. Eng., Lexington, KY, USA  
Water Resources Research 18: 2, 399-411p., 1982  
CODEN: WRERAO ISSN: 0043-1397 4 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: 3 tables  
Latitude: N360000; N370000 Longitude: E0343000; E0320000  
Descriptors: \*Turkey; \*hydrology; engineering geology;  
surveys; waterways; geologic hazards; floods;  
mathematical models; models; stochastic processes;  
statistical analysis; rivers and streams; Middle East;  
design; Goksu River; Karahacilli; Taurus Mountains  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1126811 82-45485  
**Stochastic trigger model for flood peaks; 1. Development of  
the model**  
Kavas, M. L.  
Univ. Ky., Dep. Civ. Eng., Lexington, KY, USA  
Water Resources Research 18: 2, 383-398p., 1982  
CODEN: WRERAO ISSN: 0043-1397 25 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.:  
Latitude: N360000; N370000 Longitude: E0343000; E0320000  
Descriptors: \*Turkey; \*hydrology; \*geologic hazards;  
engineering geology; rivers and streams; floods; waterways;  
models; mathematical models; stochastic processes;  
statistical analysis; Middle East; design; Goksu River;  
Karahacilli; Taurus Mountains  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1126105 82-45797  
A finite element solution of non-linear creep problems in rocks  
Giordh, G.  
Tech. Univ. Milan, Dep. Struct. Eng., Milano, IIA  
International Journal of Rock Mechanics and Mining Sciences  
& Geomechanics Abstracts 18, 1, 35-46p., 1981  
ISSN 0148-9062 22 REFS.  
Subfile B  
Country of Publ.: International  
Doc Type SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: \*deformation; \*rock mechanics; \*theoretical studies; \*creep; rheology; \*finite element analysis; statistical methods; rocks; stress; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1120420 82-41155  
Analysis of ground motion of soil caused by the exploitation of mining and use of explosions; a study of the use of explosions; report  
Sugawara, K.; Kimura, O.; Ohara, Y.; Okamura, M.  
Kumamoto Univ., Fac. Eng., JPN  
Nippon Kogyo Kaishi 97: 1115, 19-25p., 1981  
ISSN: 0369-4194 6 REFS.  
Subfile B  
Country of Publ.: Japan  
Doc Type SERIAL Bibliographic Level: ANALYTIC  
Languages: Japanese Summary Languages: English  
illus.

Latitude: N330700; N330700 Longitude: E1303600; E1303600  
Descriptors: \*Japan; \*mining geology; \*engineering geology; applications; \*explosions; ground motion; mines; coal; organic residues; strain; finite element analysis; statistical methods; Kyushu; Asia; Mieke Mine  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1125309 82-45702  
Effect of genetic factors on the closeness of correlation between properties  
Rokher, V. I.  
Moscow University Geology Bulletin 36: 4, 55-59p., 1981  
CODEN MUGRDA ISSN: 0145-8752 6 REFS.  
Subfile B  
Country of Publ.: United States  
Doc Type SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Note: Translated from Vestn. Mosk. Univ., Geol., Vol. 36, No. 4, p. 55-60, 1981, illus., 2 tables  
Descriptors: \*soil mechanics; \*soils; \*USSR; \*settlement; pedogenesis; engineering geology; experimental studies; physical properties; statistical analysis; loess; clastic sediments; loam; compression tests; materials; properties; alluvium; eluvium; Urenburg; Sakmara River floodplain  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Latitude: N214000; N237500 Longitude: E0972000; E0880000

1124406 82-45805  
Probabilistic earthquake expectancy in the Northeast Indian region  
Goswami, H. C.; Sarma, S. K.  
Gauhati Univ., Dep. Environ. Sci., Gauhati, Assam, IND  
Bulletin of the Seismological Society of America 72, 3, 999-1009p., 1982  
CODEN BSSMAP ISSN: 0037-1106 15 REFS.  
Subfile B  
Country of Publ.: United States  
Doc Type SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus. 4 tables, sketch map  
Latitude: N214000; N237500 Longitude: E0972000; E0880000

Descriptors: \*India; \*engineering geology; \*earthquakes; geologic hazards; Asia; Northeastern India; probability; magnitude; prediction; seismic risk  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1120213 82-40981  
Metodica, algoritmi si program de calcul al valorilor medii de distributie bidimensionala pentru parametrii geologici minieri cu calculatorul electronic  
Method, algorithm and calculation program for mean values of bidimensional distribution for geological parameters of mines, using electronic computers  
Enache, C.; Buleandra, I.  
ICPML, Craiova, ROM; ICPE, ROM  
Mine Petrol Gaze 27: 1, 5-9p., 1976  
CODEN: MPGADY ISSN: 0250-3115 6 REFS.  
Subfile: B  
Country of Publ.: Romania  
Doc Type SERIAL Bibliographic Level: ANALYTIC  
Languages: Romanian Summary Languages: English  
illus.: sketch maps  
Descriptors: \*mining geology; \*automatic data processing; \*maps; methods; engineering geology; cartography; mines; algorithms; computer programs; statistical analysis; graphic display  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Latitude: N330700; N330700 Longitude: E1303600; E1303600  
Descriptors: \*Japan; \*mining geology; \*engineering geology; applications; \*explosions; ground motion; mines; coal; organic residues; strain; finite element analysis; statistical methods; Kyushu; Asia; Mieke Mine  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1119260 82-41038  
Analysis of footings on vesicular laterite  
John, P. V.; Raju, V. S.  
Coll. Eng. Dep. Civ. Eng. Trivandrum, IND  
Geotech. Eng. 6: 2, 119-122p., 1975  
CODEN: GICG82 ISSN: 0046-5828 25 REFS  
Subfile B  
Country of Publ.: Thailand  
Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: 1 table  
Descriptors: \*soil mechanics; \*foundations; \*soils;  
settlement; soil group; materials; properties; laterites;  
footings; analysis; finite element analysis; statistical  
methods; triaxial tests; load tests; bearing capacity;  
methods; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1118885 82-40851  
A mixed finite element procedure for soil-structure  
interaction including construction sequences  
Lightner, J. G., III  
Virginia Polytech. Inst. and State Univ., Blacksburg, VA,  
USA  
248p., 1981  
Subfile B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc. Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: \*soil mechanics; earth pressure; finite  
element analysis; statistical methods; excavations; tunnels  
stress; soil-structure interface  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1118884 82-40850  
Free surface flow and stress analysis of earth dams  
Li, G. C.  
Virginia Polytech. Inst. and State Univ., Blacksburg, VA,  
USA  
232p., 1981  
Subfile B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc. Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: \*dams; \*soil mechanics; design; deformation  
earth dams; stress; theoretical studies; finite element  
analysis; statistical methods; seepage  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1119039 82-41169  
Trap-door problem with dry sand: a statistical approach  
based upon model test kinematics  
Vardoulakis, I.; Graf, B.; Gudehus, G.  
Univ. Karlsruhe, Inst. Soil Mech. Rock Mech., Karlsruhe, DEU  
International Journal for Numerical and Analytical Methods  
in Geomechanics 5: 1, 57-78p., 1981  
ISSN: 0363-9061 15 REFS.  
Subfile: B  
Country of Publ.: International  
Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: 1 table  
Descriptors: \*soil mechanics; deformation; kinematics;  
physical models; models; statistical analysis; sand;  
elastic sediments; gravity sliding  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1119036 82-41170  
An accuracy condition for consolidation by finite elements  
Verrulst, P. A.; Verrulst, A.  
Univ. Delft, NLD  
Int. J. Numer. Anal. Methods Geomech. 5: 1, 1-14p.,  
1981  
ISSN: 0363-9061 5 REFS.  
Subfile: B  
Country of Publ.: International  
Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.:  
Descriptors: \*soil mechanics; theoretical studies;  
consolidation; finite element analysis; statistical methods;  
mathematical models; models; pore pressure; elastic

1118883 82-40834

**An application of the finite element method for simulation of underground excavations and support systems**

Ertani, I. M.  
Virginia Polytech. Inst and State Univ., Blacksburg, VA, USA  
336p., 1981  
Subfile B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Latitude: N337500, W740700 Longitude: W0841500, W0843500  
Descriptors: \*New Mexico; \*Georgia; \*soil mechanics; \*engineering geology; \*deformation; \*underground installations; \*tunnels; \*stress; \*Fulton County; \*United States; \*York Canyon Mine; \*excavations; \*simulation; \*mathematical models; \*models; \*finite element analysis; \*statistical methods.  
Atlanta  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1118872 82-40858

**Source parameter inversion of a reservoir-induced seismic sequence, Lake Kariba, Africa, September 1983 - August 1974; a reassessment of triggering mechanisms**

Pavlin, G. B.  
Pennsylvania State Univ., University Park, PA, USA  
293p., 1981  
Subfile B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Latitude: S180000, S150000 Longitude: E030000, E020000  
Descriptors: \*Zimbabwe; \*engineering geology; \*earthquakes; \*Africa; \*induced earthquakes; \*reservoirs; \*geologic hazards; \*seismic sources; \*inverse problem; \*focal mechanism; \*seismic moment; \*discriminant analysis.  
Statistical methods: Lake Kariba  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1118392 82-40855

**Characterization and computer simulation modeling of suspended sediment transport in Colusa Basin drain, California**

Mirbagheri-Firoozabadi, S. A.  
Univ. of California, Davis, CA, USA  
333p., 1981  
Subfile B  
Degree Level: Doctoral

Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Latitude: N395500, N392500 Longitude: W1215000, W1224500  
Descriptors: \*California; \*engineering geology; \*waterways; \*Colusa County; \*United States; \*Northern California; \*automatic data processing; \*mathematical models; \*models; \*drainage; \*suspended materials; \*stream transport; \*statistical analysis.  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1118789 82-40830

**Effect of tension cutoff between the soil and foundation on structural response**

Rurrus, R. L.  
Univ. of Maryland, College Park, MD, USA  
154p., 1981  
Subfile B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: \*soil mechanics; \*foundations; \*deformation; \*theoretical studies; \*tension; \*soil-structure interface; \*earth pressure; \*finite element analysis; \*statistical methods; \*collisionless materials; \*response.  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1117955 82 41021

**New models for rock joints and interfaces**

Heuze, F. E.; Barbour, T. G.  
Lawrence Livermore Natl. Lab., Livermore, CA, USA  
Journal of the Geotechnical Engineering Division 108 G15,  
757-776p., 1982  
CODEN AJGEB6 ISSN: 0093-6405 31 REFS  
Subfile B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

Illustr.: 2 tables  
Descriptors: rock mechanics; materials; properties;  
structural analysis; finite element analysis; statistical  
methods; poisson's ratio; elastic constants; equations;  
shear strength; stress; materials; properties; isotropic  
materials; dilatation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1117935 82-40889

**Interface properties of sand**

Acar, Y. B.; Durgunoglu, H. T.; Tumay, M. T.  
La. State Univ., Dep. Civ. Eng., Baton Rouge, LA, USA;  
Bogazici Univ., Istanbul, TUR  
Journal of the Geotechnical Engineering Division 108 G14,  
648-654p., 1982  
CODEN AJGEB6 ISSN: 0093-6405 10 REFS  
Subfile B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

Descriptors: soil mechanics; foundations; materials;  
properties; design; sand; finite element analysis;  
materials; properties; clastic sediments; roughness; shear;  
stress; interfaces; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1117145 82 42458

**Statistical analysis of density and porosity of subsurface rock samples from Cauvery Basin**

Koithara, J.; Bhatt, J. S.; Raj, H.  
Oil Nat. Gas Comm., Baroda, IND

**Coastal sedimentaries of India south of 18 degrees N Latitude**

Venkatappa, B. S. (EDITOR)  
Workshop on coastal sedimentaries of India south of 18  
degrees N Latitude, India, Mar. 28-30, 1976  
India, Oil Nat. Gas Comm., Bull. 17: 1, 101-107p., 1980  
CODEN IOJGKY 3 REFS

Subfile B  
Country of Publ.: India  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
Illustr.

Descriptors: India; engineering geology; petroleum  
engineering; reservoir rocks; Asia; density; porosity;  
Cauvery Basin; cores; statistical analysis; sandstone;  
clastic rocks  
Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

1116953 82-36234

**A nonlinear seismic design procedure for nuclear facilities**

Kamil, H.; Bertero, V. V.  
Eng. Decision Anal. Co., Palo Alto, CA, USA; Univ. Calif.,  
Berkeley, Dep. Civ. Eng., USA

**Earthquake engineering research at Berkeley, 1976**  
University of California at Berkeley, College of  
Engineering, Earthquake Engineering Center, Berkeley, CA, USA  
Sixth world conference on earthquake engineering;  
Earthquake engineering research at Berkeley, 1976, New  
Delhi, India, Jan. 10-14, 1977  
Report - Earthquake Engineering Research Center, College of  
Engineering, University of California, Berkeley, California  
77/11, 91-96p., 1977  
ISSN 0271 0323 8 REFS.

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English  
Descriptors: geologic hazards; earthquakes; automatic  
data processing; nuclear facilities; effects; seismic  
response; engineering geology; seismic risk; design;  
radioactive waste; reliability; statistical analysis; shear;  
finite element analysis; statistical methods; probability  
failures  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1116951 82 36170

**Evaluation of methods for earthquake analysis of structure-soil interaction**

Gutierrez, J. A.; Chopra, A. K.  
Univ. Costa Rica, San Jose, CRI; Univ. Calif. Berkeley, Dep. Civ. Eng., USA

**Earthquake engineering research at Berkeley, 1978**

University of California at Berkeley, College of Engineering, Earthquake Engineering Center, Berkeley, CA, USA  
Sixth world conference on earthquake engineering; Earthquake engineering research at Berkeley, 1978, New Delhi, India, Jan. 10-14, 1977  
Report - Earthquake Engineering Research Center, College of Engineering, University of California, Berkeley, California 77/11, 47-51p., 1977  
ISSN: 0271-0323 11 REFS.

Subfile B  
Country of Publ.: United States  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
Descriptors \*geologic hazards; \*soil mechanics; \*foundations; earthquakes; seismic response; materials; properties; prediction; seismic risk; effects; materials; properties; half space; finite element analysis; statistical methods; Fourier analysis; elasticity  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1116948 82 35272

**Characteristics of three-dimensional ground motions along principal axes, San Fernando earthquake**

Kubo, T.; Penzien, J.  
Univ. Tokyo, Tokyo, JPN; Univ. Calif. Berkeley, Dep. Struct. Eng., USA

**Earthquake engineering research at Berkeley, 1978**

University of California at Berkeley, College of Engineering, Earthquake Engineering Center, Berkeley, CA, USA  
Sixth world conference on earthquake engineering; Earthquake engineering research at Berkeley, 1978, New Delhi, India, Jan. 10-14, 1977  
Report - Earthquake Engineering Research Center, College of Engineering, University of California, Berkeley, California 77/11, 1-6p.  
ISSN: 0271-0323 10 REFS.

Subfile B  
Country of Publ.: United States  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
illus., sketch map  
Latitude N341000, N342000 Longitude W1182500  
Descriptors \*California; engineering geology

earthquakes; United States; ground motion; three-dimensional models; statistical analysis; stochastic processes; San Fernando earthquake; intensity; frequency; Los Angeles County; Fourier analysis; stick-slip; elastic waves  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1116573 82 35202

**Experimental studies and finite-element analysis of the seismicity of North China Plain**

Luo Huizhen, Song Huizhen; Guo Caihua; Li Jianguo  
State Seismol. Bur., Inst. Geol., Beijing, CHN; Tohoku Univ., JPN

**Earthquake prediction**

Hales, A. I. (EDITOR); Suzuki, Z. (EDITOR)  
Univ. Tex. at Dallas, Programs Geosci., Richardson, TX, USA  
Inter Union Commission on Geodynamics/International Association of Seismology and Physics of the Earth's Interior Symposium on earthquake prediction, a part of the International Union of Geodesy and Geophysics, 17th general assembly, Canberra, Australia, Dec. 13-14, 1979  
Tectonophysics 85 1-2, 75-89p., 1982  
CODEN TCTOAM ISSN 0040 1951 13 REFS.  
Subfile B

Country of Publ.: Netherlands  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
illus., sketch map  
Latitude N370000, N420000 Longitude E1250000; E1150000  
Descriptors \*China; seismology; rock mechanics; deformation; earthquakes; experimental studies; mechanism; shear stress; Asia; North China Plain; finite element analysis; statistical methods; isostasy; plasticity; upper mantle; mantle; seismicity; prediction; laboratory studies; failures; creep; compression; tension  
Section Headings 19 (GEOPHYSICS, SEISMOLOGY)

1114806 82 36096

**Axisymmetric soil-structure interaction by substructure approach**

Paul, P. K.; Lee, E. J.  
Wash. Univ., St. Louis, MO, USA

**Proceedings of the International conference on recent advances in geotechnical earthquake engineering and soil dynamics, Vol. III**

Recent advances in geotechnical earthquake engineering and soil dynamics. St. Louis, MO, United States, Apr 26-May 3, 1981

Publ. Univ. Mo.  
1047 1052p. 1982

14 REFS.

Subfile B

Country of Publ.: United States

Doc Type BOOK; CONFERENCE PUBLICATION; Bibliographic Level ANALYTIC

Languages English

illus

Descriptors: soil mechanics; materials; properties; foundations; materials; properties; finite element analysis; statistical methods

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1115071 82 37482

**Geothermal reservoir modeling: a review of approaches**

Castanier, L.; Sanyal, S. K.  
Stanford Univ., Stanford, CA, USA

**Geothermal: energy for the eighties**

Brown, C. W. (chairperson)

Phillips Pet. Co., USA

Geothermal Resources Council annual meeting, Geothermal energy for the eighties, Salt Lake City, UT, United States, Sept 9-11, 1980

Transactions - Geothermal Resources Council 4, 313-316p., 1980

ISBN 0-934412-54-5 26 REFS.

Subfile B

Country of Publ.: United States

Doc Type SERIAL; CONFERENCE PUBLICATION; Bibliographic Level ANALYTIC

Languages English

illus

Descriptors: geothermal energy; mathematical geology; exploration; theoretical studies; development; simulation; reservoir rocks; models; finite element analysis; statistical methods; engineering geology

Section Headings 29 (ECONOMIC GEOLOGY, ENRGC SOURCES)

1114886 82 36477

**Cape model**

Shrivardhan, H. J.; Desai, C. S.

**Evaluation of constitutive parameters for geological materials**

Shrivardhan, H. J.; Desai, C. S.

Symposium on Implementation of computer procedures and stress/strain laws in geotechnical engineering; evaluation of constitutive parameters for geological materials. Chicago, IL, United States, Aug 3-6, 1981

Publ. Symp. Implementation Comput. Proc. and Stress/Strain Laws Geotech. Eng.

4 142p., 1981

7 REFS.

Subfile B

Country of Publ.: United States

Doc Type BOOK; CONFERENCE PUBLICATION; Bibliographic Level ANALYTIC

Languages English

illus

Descriptors: automatic data processing; soil mechanics; engineering geology; deformation; plasticity; mathematical models; failures; sand; clastic sediments; clay; stress; strain; triaxial tests; Poisson's ratio; elastic constants; finite element analysis; statistical methods

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1114801 82 35905

**Strain distribution around underground openings; statistical methods to compile and correlate rock properties, computer techniques**

Nahas, P.

Purdue Univ., Sch. Civ. Eng., Lafayette, IN, USA

133p., 1970

Subfile B

Doc Type REPORT; Bibliographic Level MONOGRAPHIC

Languages English

Report No. 4

Availability: Army, Off. Chief Eng., Washington, DC, United States

Descriptors: automatic data processing; rock mechanics; engineering geology; materials; properties; strain; materials; properties

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1114626 R2 76087

**Numerical models for track support structures**

Beatty, C. S., Stewardson, H. J.  
 Univ. Ariz., Dep. Civ. Eng., Tucson, AZ, USA; W. Va. Univ.,  
 Morgantown, WV, USA  
 Journal of the Geotechnical Engineering Division 108 G13,  
 461-486p., 1982  
 COMPEN A1GEP6 ISSN 0093-6405 31 REFS.

Subj. B  
 Country of Publ. United States  
 Doc. Type SERIAL Bibliographic Level ANALYTIC  
 Languages English

Descriptors: Colorado; engineering geology; foundations;  
 structures; finite element analysis; statistical methods;  
 three dimensional models; models; United States; Pueblo;  
 Transportation Test Center; behavior  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1114627 R2 36112

**Probabilistic analysis of deposit liquefaction**

Farde, W. J., Veneziano, D.  
 Mass. Inst. Technol., Dep. Civ. Eng., Cambridge, MA, USA  
 Journal of the Geotechnical Engineering Division 108 G13,  
 745-817p., 1982  
 COMPEN A1GEP6 ISSN 0093-6405 13 REFS.

Subj. B  
 Country of Publ. United States  
 Doc. Type SERIAL Bibliographic Level ANALYTIC  
 Languages English

Descriptors: soil mechanics; liquefaction; mechanical  
 properties; liquefaction potential; spatial variations;  
 one dimensional models; models; probability; testing;  
 production; pore pressure  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1114145 R2 36226

**Seismic resistance capacity evaluation of existing spent nuclear fuel storage racks**

Johnson, N. F., Wallis, J. C., Haighway, C. J.  
 Sci. Appl., Oak Ridge, TN, USA; Tenn. Val. Auth., Knoxville,  
 TN, USA

**Proceedings of Earthquakes and earthquake engineering: the eastern United States, two volumes**

Beaver, S. J. F. (Chairperson); Bomer, R. S. (Chairperson)  
 Union Carbide Corp., Nucl. Div., Oak Ridge, TN, USA  
 Assessing the hazard; evaluating the risk; Earthquakes and  
 earthquake engineering: the eastern United States.  
 Knoxville, TN, United States, Sept. 14-16, 1981

Publ. Ann Arbor Sci., Publ.  
 R37-857p., 1981  
 ISBN O 250-40496 6 4 REFS.  
 Subfile: 9  
 Country of Publ. United States  
 Doc. Type BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level ANALYTIC

Languages English  
 illus., 6 tables  
 Descriptors: New York; engineering geology; earthquakes  
 United States; West Valley; seismicity; foundations;  
 finite element analysis; statistical methods; deformation;  
 automatic data processing; design; analysis; seismic  
 response

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1114278 R2-35914

**An oil spill risk analysis for the Beaufort Sea, Alaska (proposed sale 71) outer continental shelf lease area**

Samuels, W. B.; Hopkins, D.; Lanfear, K. J.  
 Open-File Report (United States Geological Survey, 1973)  
 R2 4013, 111p., 1982  
 COMPEN XGR048 ISSN 0196-1497 19 REFS.

Subfile R  
 Country of Publ. United States  
 Doc. Type SERIAL, REPORT Bibliographic Level MONOGRAPHIC  
 Languages English  
 Availability: U. S. Geol. Surv., Open-File Serv., Sect.,  
 West Distrib. Branch, Denver, CO, United States  
 illus., 24 tables, sketch maps  
 Latitude: N700000; N713000 Longitude: W1440000; W1560000  
 Descriptors: Alaska; Arctic Ocean; oceanography;  
 environmental geology; engineering geology; continental  
 shelf; pollution; geologic hazards; USGS; United States;  
 outer shelf; Beaufort Sea; oil spills; petroleum;  
 probability; statistical analysis; land leases  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1111962 82-36049  
 Landslides and other mass movements  
 Czechoslovakia, Sept. 15-16, 1977  
 Int. Assoc. Eng. Geol., Bull. 16, 219-224p., 1977  
 CODEN: BIEG86 ISSN: 0074-1612 2 REFS.  
 Subtitle: B

**New stability method for embankments on clay foundations**

Wong, T. C. L. Montreal, PQ, CAN  
 Canadian Geotechnical Journal=Revue Canadienne de  
 Geotechnique, 19, 1, 44-49p., 1982  
 CODEN: CGJG86 ISSN: 0008-9674 17 REFS.  
 Subtitle: B

Country of Publ.: Canada  
 Doc Type: SERIAL; Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Illustrations: 1 table  
 Descriptors: \*soil mechanics; \*slope stability; materials,  
 properties; embankments; clay; foundations; materials,  
 properties; clastic sediments; shear strength; failures;  
 statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1111968 82-36326

**Building-up a landslide area situated on the boundary of the Carpathian Fore-deep**

Mencl, V.; Papousek, Z.; Paseka, A.  
 Geotest, Brno, CSK

**L'application de la methode des elements finis dans la stabilite des talus**

The application of the finite element method to landslide analysis  
 Simek, J.; Spottova, V.; Tyls, V.  
 Univ. Tech., Prague, CSK

Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Illustrations: 1 table  
 Descriptors: \*Czechoslovakia; engineering geology; slope stability; Europe; Bystrc; landslides; Carpathian Foredeep; statistical methods; soils; pits; finite element analysis; statistical methods; Moravia; faults; drainage; boreholes; Brno  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1111991 82-36475

**L'application de la methode des elements finis dans la stabilite des talus**

The application of the finite element method to landslide analysis  
 Simek, J.; Spottova, V.; Tyls, V.  
 Univ. Tech., Prague, CSK

Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Illustrations: 1 table  
 Descriptors: \*Czechoslovakia; engineering geology; slope stability; Europe; Bystrc; landslides; Carpathian Foredeep; statistical methods; soils; pits; finite element analysis; statistical methods; Moravia; faults; drainage; boreholes; Brno  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1111982 82-36232

**Estimation of the stress-deformation state of slopes in stratified sedimentary rocks by the finite element method**

Kalinin, E. V.; Zuyev, V. V.  
 Moscow State Univ. Dep. Eng. Geol. Found. Eng., Moscow, 50p.  
 Landslides and other mass movements  
 Wolters, R. (EDITOR)

Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Illustrations: 1 table  
 Descriptors: \*Czechoslovakia; engineering geology; slope stability; Europe; Bystrc; landslides; Carpathian Foredeep; statistical methods; soils; pits; finite element analysis; statistical methods; Moravia; faults; drainage; boreholes; Brno  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1111993 82-36475

**L'application de la methode des elements finis dans la stabilite des talus**

The application of the finite element method to landslide analysis  
 Simek, J.; Spottova, V.; Tyls, V.  
 Univ. Tech., Prague, CSK

Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Illustrations: 1 table  
 Descriptors: \*Czechoslovakia; engineering geology; slope stability; Europe; Bystrc; landslides; Carpathian Foredeep; statistical methods; soils; pits; finite element analysis; statistical methods; Moravia; faults; drainage; boreholes; Brno  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1110911 82-30847

**Quantificacao do efeito da temperatura nas estruturas de valas escoradas**  
**Quantification of thermal effects in struts of braced excavations**

Marcio F. Costa  
 Inst. Geogr. Tecnol. Estado Sao Paulo, Agrupamento Geotec.,  
 Caixa Postal 1000, Conferencia on soil mechanics and foundation engineering, Lima, Peru, Dec 1979  
 Memorias del Congreso Panamericano de Mecanica de Suelos e Fundaciones Proceedings of the Panamerican Conference on Soil Mechanics and Foundation Engineering 6, Vol. 3, 476p., 1979

Subfile B  
 Country of Publ.: Argentina  
 Doc. Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: Portuguese Summary Languages: English  
 Latitude: N24000; S230000 Longitude: W04630'00; W04700'00  
 Descriptors: Brazil; soil mechanics; engineering geology  
 : theoretical studies; load pressure; South America; Sao Paulo; Sao Paulo City; earth pressure; finite element analysis; statistical methods; temperature; thermal effects  
 : excavations; subways; tunnels  
 : Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1111176 82-30587

**Aplicacion de programas no restringidos de elementos finitos a la interaccion suelo, fundacion, superestructura**  
**Application of unrestricted finite element programs to soil, foundation and superstructure interaction**

Boltonesi, A. J. L.  
 Univ. E. Aires, Geotec., Buenos Aires, ARG  
 Sixth Panamerican Conference on Soil Mechanics and Foundation Engineering, Lima, Peru, Dec 1979  
 Memorias del Congreso Panamericano de Mecanica de Suelos e Fundaciones Proceedings of the Panamerican Conference on Soil Mechanics and Foundation Engineering 6, Vol. 3, 269-281p., 1979

Subfile B  
 Country of Publ.: Argentina  
 Doc. Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: Spanish  
 Descriptors: soil mechanics; theoretical studies; finite element analysis; statistical methods; foundations; earth pressure; soil structure interface  
 : Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1110911 82-30635

**Mixed finite element methods for miscible displacement problems in porous media**

Barlow, B. L.; Ewing, R. E.; Wheeler, M. F.  
 Exxon Prod. Res. Co., USA; Mobil Res. and Dev. Corp., USA

**Proceedings; Sixth SPE symposium on reservoir simulation**

Anonymous  
 Sixth SPE Symposium on reservoir simulation, New Orleans, LA, United States, Feb 1-3, 1982

Proceedings: Symposium on Reservoir Simulation 6, 137-148p., 1982  
 ISSN: 0272-2534 20 REFS.

Subfile B  
 Country of Publ.: United States

Doc. Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
 Note: SPE 10501, illus.  
 Descriptors: engineering geology; petroleum engineering; mathematical models; finite element analysis; statistical methods; porous materials; reservoir locks; mathematical methods; Darcy velocity; models; simulation  
 : Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1110888 82-31031

**Optimizatsiya ob'yemov burovykh rabot pri zavershenii razvedki mestorozhdeniya**  
**Optimizing the volume of drilling work while completing deposit exploration**

Vasil'yev, V. B.; Alekseyev, Y. Y.; Kulichkova, L. B.

Nefteqozovaya Geologiya i Geofizika 1981, 12, 20-22p. 1981

CODEN: NGRSAX ISSN: 0028-1182  
 Subfile B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc. Type: SERIAL: Bibliographic Level: ANALYTIC

Languages: Russian  
 Descriptors: engineering geology; automatic data processing; petroleum; petroleum engineering; exploration production; statistical analysis; equations; recovery  
 : Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

110697 82 31001  
**Vyziti vypočetni techniky při registraci sesuvu v CSR**  
**The use of computer methods in a central register of**  
**landslide data in Czechoslovakia**  
 Spurek, M  
 Geol. Průzkum 20 2 312301. 44-46p. 1978  
 CODEN: GEPDAN ISSN 0016-772X  
 Subfile B  
 Country of Publ.: Czechoslovakia  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Czech Summary Languages: English  
 illus.: 2 tables, sketch map  
 Descriptors: \*Czechoslovakia; \*automatic data processing; \*  
 engineering geology; \*slope stability; Europe; landslides;  
 data storage; statistical analysis; Geofond; Prague; data  
 bases; geologic hazards; Bohemia; Moravia  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

110709 82 30616  
**Probability of failure and safety factors in stability of**  
**natural slopes**  
 Chandra, H P. Subrahmanyam, R V  
 Univ. Singapore, Singapore, SGP  
**Proceedings, international symposium on landslides; Vol. 1**  
 Swaminathan, C G (Editor)  
 International symposium on landslides. New Delhi, India.  
 Apr 2 11, 1980  
 Publ. South Prakashan  
 263 266p. 1980  
 9 REFS  
 Subfile C  
 Country of Publ.: India  
 Doc Type: BOOK CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.: 2 tables  
 Descriptors: \*Singapore; engineering geology; slope  
 stability; landslides; failures; techniques; case studies;  
 Asia  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

110711 82 30973  
**Räumliche Berechnung von Spannungen und Verformungen im**  
**Bereich der Ortsbrust von Tunnelbauwerken**  
**Three dimensional computation of strain and deformation in**  
**the tunnel face region**  
 Gumpich, S  
 RWTH Aachen, DEU  
**4 Nationale Tagung ueber Felsmechanik**

**The fourth national congress on rock mechanics**  
 Wittke, W (EDITOR)  
**4. Nationale Tagung ueber Felsmechanik. Aachen, Germany.**  
 Federal Republic of May 5-6, 1980  
 Nationale Tagung ueber Felsmechanik 4. 409-439p., 1980  
 13 REFS  
 Subfile B  
 Country of Publ.: Germany, Federal Republic of  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: German Summary Languages: English  
 illus.  
 Descriptors: \*tunnels; theoretical studies; stress;  
 deformation; mathematical models; models; elasticity;  
 anisotropy; finite element analysis; statistical methods;  
 three-dimensional models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1108206 82 30920  
**Ein Berechnungsverfahren zur Untersuchung der dynamischen**  
**Beanspruchung von Felsbauten**  
**Methods of calculation in the investigation of dynamic**  
**loading in rock structures**  
 Pilschke, B  
 RWTH, Aachen, DEU

**4. Nationale Tagung ueber Felsmechanik**  
**The fourth national congress on rock mechanics**  
 Wittke, W (EDITOR)  
**4. Nationale Tagung ueber Felsmechanik. Aachen, Germany.**  
 Federal Republic of May 5-6, 1980  
 Nationale Tagung ueber Felsmechanik 4. 259-277p., 1980  
 9 REFS  
 Subfile B  
 Country of Publ.: Germany, Federal Republic of  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: German Summary Languages: English  
 illus.  
 Descriptors: \*automatic data processing; rock mechanics;  
 engineering geology; deformation; loading; tunnels;  
 caverns; underground installations; finite element analysis;  
 statistical methods; dams; slopes; three dimensional  
 models; models; algorithms  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1107855 82-30486

**Behaviour of the Bay Area Rapid Transit tunnels through the Hayward Fault**

Proun, J R  
 Univ. of California, Berkeley, CA, USA  
 22pp., 1981  
 Subfile B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: TIFSIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Latitude: N374500; Longitude: W1221000; W1222000  
 Descriptors: \*California; engineering geology; tunnels; Alameda County; United States; San Francisco Bay region; Central California; Berkeley; Hayward Fault; active faults; Faults; Bay Area Rapid Transit; subways; finite element analysis; statistical methods; rock mechanics; geologic hazards  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1107840 82-30521

**Modelling of soil-structure interaction by finite and infinite elements**

Medina-Melo, F. J.  
 Univ. of California, Berkeley, CA, USA  
 53p., 1981  
 Subfile B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: TIFSIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*soil mechanics; elasticity; seismic response; theoretical studies; finite element analysis; statistical methods; elastic waves; propagation; soil-structure reactions; soil dynamics; mathematical models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1107839 82-30513

**Finite element analysis of interacting soil-structure-fluid systems with local nonlinearities**

Khalvati, M.  
 Univ. of California, Berkeley, CA, USA  
 215p., 1981  
 Subfile B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: TIFSIS Bibliographic Level: MONOGRAPHIC  
 Languages: English

Availability: Univ. Microfilms  
 Descriptors: \*soil mechanics; theoretical studies; seismic response; geologic hazards; joints; fractures; S waves; propagation; fluid phases; soil dynamics; ground motion; soil-structure reactions; finite element analysis; statistical methods; elasticity; mathematical models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1107838 82-30510

**A simplified procedure for reliability analysis in geotechnical engineering**

Howland, J D  
 Rouseleiner Polytech. Inst., Troy, NY, USA  
 226p., 1981  
 Subfile B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: TIFSIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*geologic hazards; engineering geology; site exploration; statistical analysis; slope stability; soil mechanics; geotechnical engineering; reliability  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1106487 82-30590

**Ground control for shallow tunnels by soil grouting/discussion**

Reichert, K W; Klapperich, H  
 Tech. Univ. Berlin, Civ. Eng. Dep., Berlin, DEU  
 Journal of the Geotechnical Engineering Division 107: GT12, 1745p., 1981  
 CODEN: JGCEB6 ISSN: 0093-6405 2 REFS.  
 Subfile B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: For reference to original article, see Int. J. Y. and Clough, G. W., J. Geotech. Eng. Div., Am. Soc. Civ. Eng., Vol. 106, No. 9, 1980.  
 Descriptors: \*soil mechanics; tunnels; deformation; stability; loading; grouting; creep; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1106484 82 30767

**Lateral pile response during earthquakes**

Kochwa, J. J. Kraft, L. M. Jr.  
McLellan Eng. Houston, Tx, USA  
Journal of the Geotechnical Engineering Division 107: G112,  
1979 1731p., 1981

CODEN: AJGER6 ISSN: 0093-6405 56 REFS  
Subfile B  
Country of Publ.: United States  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages English  
illus. 1 table  
Descriptors: \*soil mechanics; \*foundations; \*earthquakes;  
materials; properties; piles; effects; liquefaction;  
stability; pore pressure; cohesionless materials; finite  
element analysis; statistical methods; Poisson's ratio;  
elastic constants; materials; properties.  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1106470 82 30768

**Field measurements of an earth support system**

Shen, C. K. Bang, S. J. Ramstad, K. M.; Kulchin, L.  
DeNatalo, J. S. Dep Civ Eng, Davis, CA, USA; Univ. Notre  
Dame, Notre Dame, USA  
Journal of the Geotechnical Engineering Division 107: G112,  
1979 1642p., 1981

CODEN: AJGER6 ISSN: 0093-6405 10 REFS.  
Subfile B  
Country of Publ.: United States  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages English  
1 table  
Descriptors: \*Oregon; \*soil mechanics; \*California;  
engineering geology; applications; foundations; United  
States; Portland; Davis; excavations; finite element  
analysis; statistical methods; ground motion  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1106387 82 30898

**Využitie jednoduchych statistických grafických metod pri  
inžinierskogeologickom výskume puklinovitosti  
the application of simple statistical graphic methods in the  
engineering geological exploration of fissurization**

Dudrácik, P. Hlavdzusová, H.  
Geol. Průmysl 19: 5, 131-134p., 1977

CODEN: GEYPAN ISSN: 0016-772X  
Subfile B  
Country of Publ.: Czechoslovakia  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages Czech Summary Languages English

illus. 2 tables  
Descriptors: \*Czechoslovakia; \*structural analysis;  
structural geology; fractures; statistical analysis;  
graphic methods; granodiorite; granite-granodiorite family;  
Europe; engineering geology; techniques; site exploration;  
Lambertov; preferred orientation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1106172 82-30656

**O primeneni korrelyatsionno-regressionnogo analiza v  
inzhenerno-geologicheskoy praktike (na primere otsenki  
prosadochnosti lessovykh porod Predkavkaz'ya)  
Applying a correlation-regression analysis to engineering  
geology practice; slumped loess rocks of the Caucasus Foreland**

Dikovskiy, A. L.  
Vyssh. Uchebn. Zaved. Izv. Geol. Razved. 1979: R. 59-61  
1979

CODEN: IJUGAF ISSN: 0016-7762 8 REFS.  
Subfile B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages Russian  
Descriptors: \*USSR; \*automatic data processing;  
engineering geology; slope stability; Caucasus Foreland;  
regression analysis; loess; clastic sediments; statistical  
analysis; Caucasus; slumping  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1106370 82 30898

**Field measurements of an earth support system**

Shen, C. K. Bang, S. J. Ramstad, K. M.; Kulchin, L.  
DeNatalo, J. S. Dep Civ Eng, Davis, CA, USA; Univ. Notre  
Dame, Notre Dame, USA  
Journal of the Geotechnical Engineering Division 107: G112,  
1979 1642p., 1981

CODEN: AJGER6 ISSN: 0093-6405 10 REFS.  
Subfile B  
Country of Publ.: United States  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages English  
1 table  
Descriptors: \*Oregon; \*soil mechanics; \*California;  
engineering geology; applications; foundations; United  
States; Portland; Davis; excavations; finite element  
analysis; statistical methods; ground motion  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1106387 82 30898

**Využitie jednoduchych statistických grafických metod pri  
inžinierskogeologickom výskume puklinovitosti  
the application of simple statistical graphic methods in the  
engineering geological exploration of fissurization**

Dudrácik, P. Hlavdzusová, H.  
Geol. Průmysl 19: 5, 131-134p., 1977

CODEN: GEYPAN ISSN: 0016-772X  
Subfile B  
Country of Publ.: Czechoslovakia  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages Czech Summary Languages English

1105216 82-24083

**Morphological equations based on variational principles**

Murru, S.; Ratuca, D.  
Hydraul. Eng. Res. Sta., Bucharest, ROM

**Proceedings of the International symposium on river sedimentation**

Li Renjing (chairperson)  
China, Chinese Society of Hydraulic Engineering, CHN  
International symposium on river sedimentation, Beijing, China, Mar. 24-29, 1980  
Publ. Gumpflua Press  
623-637p., 1980  
6 REFS

Subfile B  
Country of Publ.: China  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: Chinese  
Title:

Descriptors: hydrology; sedimentation; rivers and streams; transport; stream transport; engineering geology; hydraulics; channel geometry; equations; waterways; rivers; statistical analysis  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1104855 82-24465

**Settlement analysis of soft clays reinforced with granular piles**

Balam, N. P.; Poulos, H. G.; Brown, P. I.

**Proceedings of the Fifth Southeast Asian conference on soil engineering**

Brand, E. W. (chairperson)  
The Fifth Southeast Asian conference on soil engineering, Bangkok, Thailand, July 24, 1977  
Proceedings of the Southeast Asian Conference on Soil Engineering 5, 81-92p., 1977  
24 REFS

Subfile B  
Country of Publ.: Thailand  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: foundations; soil mechanics; piles; settlement; clay; Poisson's ratio; elastic constants; Young's modulus; pressure; pore pressure; clastic sediments; behavior; finite element analysis; statistical methods; consolidation; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1104731 82-24391

**Sediment characteristics of alpine mudflows in the Nigel Pass area, Canadian Rocky Mountains**

Owens, I. F.  
York Univ., Downsview, ON, CAN

**Ninth congress of the International Union for Quaternary Research; abstracts**

Anonymous  
Ninth congress of the International Union for Quaternary Research, Christchurch, New Zealand, Dec. 2-10, 1973  
Congress of the International Union for Quaternary Research 9, 274-275p., 1973  
Subfile: B

Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Latitude: N513000; N520000 Longitude: W1164500; W1173000  
Descriptors: Rocky Mountains; Alberta; sediments; engineering geology; textures; slope stability; grain size; North America; Northern Rocky Mountains; Canadian Cordillera; Banff National Park; Jasper National Park; Nigel Pass, Canada; alpine environment; statistical analysis; mudflows  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1104259 82-24581

**Studiul statistic al influentel adinciml asupra rezistentel la compresiu a roeiilor  
Statistical study of depth influence on rock compressive strength**

Constantinescu, I.; Noaghi, T.  
Inst. Mine, Petrosani, ROM  
Mine, Pet. Gaze (Buchar.) 28, 6, 256-261p., 1977  
CODEN: MPGADY ISSN: 0250-3115 3 REFS.  
Subfile: B

Country of Publ.: Romania  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Romanian Summary Languages: English  
12 tables

Descriptors: rock mechanics; Romania; materials; properties; engineering geology; compressive strength; materials; plasticity; depth; statistical analysis; sandstone; clastic rocks; shale; Lower Europe  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Franko, E.; Jamolkowski, M.; Janbu, N.; Massarsch, K. R.;  
St. John, H. D.; Lewin, P. J.; Powell, J. J. W.

**Design parameters in geotechnical engineering--Parametres de  
conception dans la geotechnique**

Seventh European conference on soil mechanics and foundation  
engineering, Brighton, United Kingdom, Sept. 1979  
European Regional Conference of the International Society  
for Soil Mechanics and Foundation Engineering 7, Vol. 4,  
19-61p., 1980  
ISBN: 0-7277-0080-4 67 REFS.

Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English  
Illustrations: 1 table  
Descriptors: \*soil mechanics; applications; factors;  
clay; elastic sediments; soft clays; design; stress;  
triaxial tests; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103450 82-24818

**Deformation characteristics of broken schist in a rockfill  
dam**

Kinze, M.

**Design parameters in geotechnical engineering--Parametres de  
conception dans la geotechnique**

Seventh European conference on soil mechanics and foundation  
engineering, Brighton, United Kingdom, Sept. 1979  
European Regional Conference of the International Society  
for Soil Mechanics and Foundation Engineering 7, Vol. 3,  
219-223p., 1979  
ISBN: 0-7277-0080-4

Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Descriptors: East Germany; rock mechanics; engineering  
geology; materials; properties; dams; schists;  
foundations; deformation; argillaceous texture; finite  
element analysis; statistical methods; strain; stress;  
Germany; Europe; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103478 82 25139

**Statistics, reliability theory and safety factors**

Simons, H.

**Design parameters in geotechnical engineering--Parametres de  
conception dans la geotechnique**

Seventh European conference on soil mechanics and foundation  
engineering, Brighton, United Kingdom, Sept. 1979  
European Regional Conference of the International Society  
for Soil Mechanics and Foundation Engineering 7, Vol. 5,  
81-90p., 1981  
ISBN: 0-7277-0080-4 18 REFS.

Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Descriptors: \*soil mechanics; materials; properties;  
statistical analysis; factors; safety; materials;  
properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103467 82 24747

**Statistics, reliability theory and safety factors**

Hiro, Y.; Simons, H.; Biermatovski, K.; Schultze, E.; Hight,  
D. W.; Driscoll, R. M. C.; Gallagher, K. A.

**Design parameters in geotechnical engineering--Parametres de  
conception dans la geotechnique**

Seventh European conference on soil mechanics and foundation  
engineering, Brighton, United Kingdom, Sept. 1979  
European Regional Conference of the International Society  
for Soil Mechanics and Foundation Engineering 7, Vol. 4,  
95-119p., 1980  
ISBN: 0-7277-0080-4 61 REFS.

Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Descriptors: \*soil mechanics; materials; properties;  
factors; statistical analysis; exploration; foundations;  
reformation; design; construction; friction; excavations;  
finite element analysis; statistical methods; materials;  
properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103465 82 24675

**Design parameters for soft clays**

1103447 82-24637

**Excavite en paroi moulee dans des limons argileux; calculs et observations**

Dysli, M.; Fontana, A.; Rybisak, J

**Design parameters in geotechnical engineering--Parametres de conception dans la geotechnique**

Seventh European conference on soil mechanics and foundation engineering, Brighton, United Kingdom, Sept. 1979  
European Regional Conference of the International Society for Soil Mechanics and Foundation Engineering 7, Vol 3, 197-205p., 1979  
ISBN: 0-7277-0080-4 11 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC  
Languages: French  
2 tables

Descriptors: Europe; soil mechanics; engineering geology; materials; properties; foundations; silt; Lake Geneva; excavations; deformation; finite element analysis; statistical methods; construction; materials; properties; clastic sediments  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103445 82-24580

**Analysis of a progressive failure in Panonian clay**

Constantinescu, A.; Comsa, R.; Matei, L.

**Design parameters in geotechnical engineering--Parametres de conception dans la geotechnique**

Seventh European conference on soil mechanics and foundation engineering, Brighton, United Kingdom, Sept 1979  
European Regional Conference of the International Society for Soil Mechanics and Foundation Engineering 7, Vol. 3, 189-192p., 1979  
ISBN: 0-7277-0080-4 5 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC  
Languages: English  
illus., 2 tables

Descriptors: Romania; soil mechanics; engineering geology; materials; properties; slope stability; clay; Europe; Transylvania; landslides; clastic sediments; Panonian; Neogene; Tertiary; excavations; behavior; weathering; finite element analysis; statistical methods; stability; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103386 82-25155

**Lateral earth pressure due to surcharge loads**

Smolczyk, U.; Vogt, N.; Hilmer, K.

**Design parameters in geotechnical engineering--Parametres de conception dans la geotechnique**

Seventh European conference on soil mechanics and foundation engineering, Brighton, United Kingdom, Sept. 1979  
European Regional Conference of the International Society for Soil Mechanics and Foundation Engineering 7, Vol. 2, 131-139p., 1979  
ISBN: 0-7277-0080-4 18 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC  
Languages: English  
illus., 1 table

Descriptors: soil mechanics; West Germany; earth pressure; engineering geology; loading; finite element analysis; statistical methods; density; stress; Germany; Europe; Nuremberg  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103356 82-25088

**Tentative d'evaluation probabiliste du niveau de securite des ouvrages**

Tentative probability evaluation of structural safety  
Salembier, M.

**Design parameters in geotechnical engineering--Parametres de conception dans la geotechnique**

Seventh European conference on soil mechanics and foundation engineering, Brighton, United Kingdom, Sept. 1979  
European Regional Conference of the International Society for Soil Mechanics and Foundation Engineering 7, Vol. 1, 249-256p., 1979  
ISBN: 0-7277-0080-4 7 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC  
Languages: French Summary Languages: French  
illus., 1 table

Descriptors: foundations; stability; theoretical studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103335 82-24623

**Optimum designs of state of the consolidation of soil medium**  
Dzinski, J.; Witk, J.

**Design parameters in geotechnical engineering--Parametres de conception dans la geotechnique**

Seventh European Conference on soil mechanics and foundation engineering, Brighton, United Kingdom, Sept. 1979  
European Regional Conference of the International Society for Soil Mechanics and Foundation Engineering 7, Vol. 1, 143-146p., 1979

ISBN 0-7277-0090-4 15 REFS.

Subfile B

Country of Publ.: International

Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic

Level ANALYTIC

Languages English

illus., 1 table

Descriptors: \*soil mechanics; materials; properties; consolidation; materials; properties; design; soils; finite element analysis; statistical methods

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103317 82-24532

**Movements around excavations in London Clay**

Burland, J. B.; Simpson, B.; St. John, H. D.

**Design parameters in geotechnical engineering--Parametres de conception dans la geotechnique**

Seventh European conference on soil mechanics and foundation engineering, Brighton, United Kingdom, Sept. 1979  
European Regional Conference of the International Society for Soil Mechanics and Foundation Engineering 7, Vol. 1, 13-29p., 1979

ISBN 0-7277-0080-4 29 REFS.

Subfile B

Country of Publ.: International

Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic

Level ANALYTIC

Languages English

illus.

Descriptors: \*England; rock mechanics; engineering; geology; excavations; materials; properties; Europe; finite element analysis; statistical methods; materials; properties; London Clay; Eocene; Paleogene; Tertiary; stratigraphy

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103242 82-25085

**Heaving conditions by freezing of soils**

Saetersdal, R.

Norw., Road Res. Lab., Oslo, NOR; Norw., Road Res. Lab., NOR

**Ground freezing 1980**

Frivik, P. E. (EDITOR); Janbu, N. (EDITOR); Saetersdal, R. (EDITOR); Finborud, L. I. (EDITOR)

Norw., Inst. Technol., Div. Refrig. Eng., Trondheim, NOR  
Second international symposium on ground freezing, Trondheim, Norway, June 24-26, 1980

Eng. Geol. 18, 1-4, 291-305p., 1981

CODEN: EGGQAO ISSN: 0013-7952 40 REFS

Subfile B

Country of Publ.: International

Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic

Level ANALYTIC

Languages English

illus., 9 tables

Descriptors: \*soil mechanics; \*permafrost; frost action; frost heaving; observations; mechanism; prediction; probability; indicators; laboratory studies; frozen ground

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103241 82-25019

**An attempt at a new formulation of the criteria of frost heave**

Pietrzyk, K.

Krakow Tech. Univ., Inst. Geotechnics, Krakow, POL; Norw., Road Res. Lab., NOR

**Ground freezing 1980**

Frivik, P. E. (EDITOR); Janbu, N. (EDITOR); Saetersdal, R. (EDITOR); Finborud, L. I. (EDITOR)

Norw., Inst. Technol., Div. Refrig. Eng., Trondheim, NOR  
Second international symposium on ground freezing, Trondheim, Norway, June 24-26, 1980

Eng. Geol. 18, 1-4, 281-290p., 1981

CODEN: EGGQAO ISSN: 0013-7952 4 REFS.

Subfile B

Country of Publ.: International

Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic

Level ANALYTIC

Languages English

illus., 1 table

Descriptors: \*soil mechanics; highways; frost action; frost heaving; prediction; laboratory studies; probability; frozen ground

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103231 82-24780

**Optimization of the freeze pipe arrangement and the necessary refrigeration plant capacity by a PEM-computer program**

Jessberger, H. L.; Makowski, E.  
Publ. Univ., Dep. Civ. Eng., Bochum, DEU; Norw. Road Res. Lab., NOR

**Ground freezing 1980**

Frivik, P. E. (EDITOR); Janbu, N. (EDITOR); Saetersdal, R. (EDITOR); Finborud, L. I. (EDITOR)  
Norw. Inst. Technol., Div. Refrig. Eng., Trondheim, NOR  
Second International Symposium on ground freezing, Trondheim, Norway, June 24-26, 1980  
Eng. Geol. 18: 1-4, 175-188p, 1981  
CODEN EGGDAA ISSN: 0013-7952 25 REFS.

Subfile B  
Country of Pub: International  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
illus.  
Descriptors: soil mechanics; automatic data processing; methods; engineering geology; artificial ground freezing; frozen ground; computer programs; instruments; optimization; finite element analysis; statistical methods; heat transfer; thermal properties; freezing  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103230 82-24791

**Developments and applications of frost susceptibility testing**

Jones, R. H.  
Univ. Nottingham, Dep. Civ. Eng., Nottingham, GBR; Norw. Road Res. Lab., NOR

**Ground freezing 1980**

Frivik, P. E. (EDITOR); Janbu, N. (EDITOR); Saetersdal, R. (EDITOR); Finborud, L. I. (EDITOR)  
Norw. Inst. Technol., Div. Refrig. Eng., Trondheim, NOR  
Second International Symposium on ground freezing, Trondheim, Norway, June 24-26, 1980  
Eng. Geol. 18: 1-4, 269-280p, 1981  
CODEN EGGDAA ISSN: 0013-7952 21 REFS.

Subfile B  
Country of Pub: International  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
illus.: 3 tables  
Descriptors: soil mechanics; frost action; frost heaving; prediction; testing; techniques; sample preparation; instruments; frozen ground; probability  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1103232 82-24678

**Thermal design of artificial soil freezing systems**

Frivik, P. E.; Thorbergsen, E.  
Norw. Inst. Technol., Div. Refrig. Eng., Trondheim, NOR; Norw. Road Res. Lab., NOR

**Ground freezing 1980**

Frivik, P. E. (EDITOR); Janbu, N. (EDITOR); Saetersdal, R. (EDITOR); Finborud, L. I. (EDITOR)  
Norw. Inst. Technol., Div. Refrig. Eng., Trondheim, NOR  
Second International Symposium on ground freezing, Trondheim, Norway, June 24-26, 1980  
Eng. Geol. 18: 1-4, 189-201p, 1981  
CODEN EGGDAA ISSN: 0013-7952 20 REFS.

Subfile B  
Country of Pub: International  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
illus.: 3 tables  
Descriptors: soil mechanics; automatic data processing; methods; engineering geology; artificial ground freezing; thermal properties; design; instruments; thermal regime; computer programs; finite difference analysis; finite element analysis; statistical methods; heat transfer; instrumentation; frozen ground; freezing  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

110241 82-24180

**Evaluation of a chimney drain design in an earthfill dam**

Musick, M. L.; Aral, M. M.  
U. S. Geol. Surv., Davisville, GA, USA, Ga Inst Technol.  
Soils under cyclic loading  
Ground Water 20 1 22 31p 1982  
CODEN GWAAAP ISSN 0017-4674 23 REFS  
Subtitle B  
Country of Publ: United States  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages English  
illus 3 tables  
Latitude N331500, N333000 Longitude W0831500, W0833000  
Descriptors Geology; ground water; automatic data processing; engineering analysis; surveys; hydrogeology; dams; Fulton County, United States; Wallace Dam; Oconee River; Fatigue; seepage; earth dams; design; drainage; pore pressure; finite element analysis; statistical methods; finite difference analysis; hydrology  
Section Headings 21 (HYDROGEOLOGY AND HYDROLOGICAL ENGINEERING)

110246 82-25162

**Acoustic emission study of microfracturing during the cyclic loading of Westerly granite**

Soudergeld, C. H.; Estey, J. H.  
Univ. Colo., NOAA, Geop. Inst. for Res. in Environ. Sci., Boulder, CO, USA  
JGR: Journal of Geophysical Research, B 86 4 2945 2954 P 1981  
ISSN 0196-9436 11 REFS  
Subtitle B  
Country of Publ: United States  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages English  
Descriptors rock mechanics; earthquakes; igneous rocks; materials; properties; focal mechanisms; granites; failures; prediction; mechanical properties; Westerly Granite; cyclic loading; least squares analysis; statistical methods; stress; materials; properties; equations; experimental studies; strain  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

110247 82-24717

**Finite element nonlinear seismic response analysis of submarine pipe-soil interaction**

Haidari, A. K.; Reddy, D. V.; Arackiasamy, M.; Bobby, M.  
Mem. Univ. Newfoundland, St. John's, NF, CAN  
Soils under cyclic and transient loading  
Pandey, G. N. (EDITOR); Zienkiewicz, O. C. (EDITOR)

Univ. Coll., Swansea, Dep. Civ. Eng., Swansea, GBR  
International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980

Publ. A A Balkema  
1 2 867-877p 1980  
ISBN 90 6191 076 5 35 REFS  
Subtitle B  
Country of Publ: Netherlands  
Doc Type BOOK: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
illus 4 tables  
Descriptors soil mechanics; underground installations; deformation; rock mechanics; shear modulus; porous materials; finite element analysis; statistical methods; Poisson's ratio; elastic constants; saturation; viscous materials; seismic response; pipelines; materials; properties  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102811 82-24999

**Shutdown of elasto-plastic continua with special reference to soil-rock structures**

Pandey, G. N.; Davis, E. H.; Abdullah, W. S.  
Soils under cyclic and transient loading  
Pandey, G. N. (EDITOR); Zienkiewicz, O. C. (EDITOR)  
Univ. Coll., Swansea, Dep. Civ. Eng., Swansea, GBR  
International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
Publ. A A Balkema  
1 2 739-746p 1980  
ISBN 90 6191 076 5 10 REFS  
Subtitle B  
Country of Publ: Netherlands  
Doc Type BOOK: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
illus 1 table  
Descriptors foundations; soil mechanics; structures; deformation; marine installations; offshore; design; construction; cyclic loading; finite element analysis; statistical methods; behavior  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102810 82-2441G

**Finite element linear programming approach to foundation shakedown**

Aboustit, B. L.; Reddy, D. V.  
New Univ Newfoundlan, St. John's, NF, CAN

**Soils under cyclic and transient loading**

Pande, G. N. (EDITOR); Zienkiewicz, O. C. (EDITOR)  
Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980

Publ. A. A. Balkema  
1. 2. 727-738p., 1980  
ISBN: 90-6191-076-5 33 REFS

Subfile B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.: 6 tables

Descriptors: \*automatic data processing; \*soil mechanics;

engineering geology; materials; properties; foundations;

finite element analysis; statistical methods; analysis;

computer programs; stress; soils; clays; materials;

properties

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102809 82-25035

**A general mathematical model for clay core rockfill dams**

Pisarcu, R.; Stematianu, D.; Ilie, L.

**Soils under cyclic and transient loading**

Pande, G. N. (EDITOR); Zienkiewicz, O. C. (EDITOR)  
Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980

Publ. A. A. Balkema

1. 2. 713-725p., 1980

ISBN: 90-6191-076-5 13 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.: 1 table

Descriptors: \*automatic data processing; \*dams; \*soil

mechanics; engineering geology; design; deformation;

earth dams; clay; mathematical models; models; clastic

sediments; finite element analysis; statistical methods;

permeability; young's modulus; elastic constants;

settlement; stress

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102808 82-25034

**The influence of consolidation phenomenon upon stresses in embankment dams**

Pisarcu, R.; Popovici, A.; Ilie, L.; Stere, C.

**Soils under cyclic and transient loading**

Pande, G. N. (EDITOR); Zienkiewicz, O. C. (EDITOR)  
Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980

Publ. A. A. Balkema

1. 2. 705-712p., 1980

ISBN: 90-6191-076-5 8 REFS

Subfile B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: \*dams; \*soil mechanics; design; materials;

properties; embankments; pore pressure; earth dams;

permeability; finite element analysis; statistical methods;

stress; materials; properties

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102780 82 24447

**A finite element study on earth covered structures subjected to impact loading**

Pelt, R

**Soils under cyclic and transient loading**

Panda, G. N (EDITOR); Zienkiewicz, O. C. (EDITOR)  
 Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
 International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
 Publ. A. A. Balkema  
 1, 2, 673 68p.  
 ISBN 90 6191 076 5 9 REFS  
 Subfile B

Country of Publ. Netherlands Bibliographic  
 Doc. Type BOOK; CONFERENCE PUBLICATION  
 Level ANALYTIC  
 Languages English  
 Title

Descriptors \*foundations; \*soil mechanics; structures; materials; properties; engineering properties; triaxial tests; finite element analysis; statistical methods; loading; elastostatic stress; equations; materials; properties  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102781 82 24448

**Stress strain relationship of sand and its application to FEM analysis**

Tobita, T.; Kawasawa, F

**Soils under cyclic and transient loading**

Panda, G. N (EDITOR); Zienkiewicz, O. C. (EDITOR)  
 Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
 International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
 Publ. A. A. Balkema  
 1, 2, 653 66p.  
 ISBN 90 6191 076 5 10 REFS  
 Subfile B

Country of Publ. Netherlands Bibliographic  
 Doc. Type BOOK; CONFERENCE PUBLICATION  
 Level ANALYTIC  
 Languages English  
 Title

Descriptors \*soil mechanics; materials; properties; finite element analysis; statistical methods; sand; elastic sediments; materials; properties; elasticity; deformation; behavior; consolidation; strain; triaxial tests; stress  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Numerical and analytical computations of excess pore pressures**

Koenders, M. A.; Saathof, L. E. B.

**Soils under cyclic and transient loading**

Panda, G. N (EDITOR); Zienkiewicz, O. C. (EDITOR)  
 Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
 International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
 Publ. A. A. Balkema  
 1, 2, 619 625p.  
 ISBN 90 6191 076 5 3 REFS  
 Subfile B

Country of Publ. Netherlands Bibliographic  
 Doc. Type BOOK; CONFERENCE PUBLICATION  
 Level ANALYTIC  
 Languages English  
 Title

Descriptors \*soil mechanics; materials; properties; pore pressure; analysis; finite element analysis; statistical methods; triaxial tests; models; materials; properties  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102782 82 24447

**Endochronic models for soils**

Arslan, A. M.; Razant, Z. P.; Krizek, R. J.  
 Istanbul Tech. Univ., Istanbul, TUR; Northwest Univ., Evanston, Ill., USA

**Soils under cyclic and transient loading**

Panda, G. N (EDITOR); Zienkiewicz, O. C. (EDITOR)  
 Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
 International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
 Publ. A. A. Balkema  
 1, 2, 475 476p.  
 ISBN 90 6191 076 5 12 REFS  
 Subfile B

Country of Publ. Netherlands Bibliographic  
 Doc. Type BOOK; CONFERENCE PUBLICATION  
 Level ANALYTIC  
 Languages English  
 Title

Descriptors \*soil mechanics; materials; properties; cyclic loading; models; soils; factors; stress; stability; plasticity; finite element analysis; statistical methods; materials; properties  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102798 82 24433

- 1102765 82-25197  
**Endochronic constitutive equation for soil**  
 Szavits Nossan, A.  
**Soils under cyclic and transient loading**  
 Pande, G. N. (EDITOR); Zienkiewicz, O. C. (EDITOR)  
 Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
 International symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
 Publ. A. A. Balkema  
 1. 2. 347-352p. 1980  
 ISBN 90-6191-076-5 12 REFS.  
 Subfile B  
 Country of Publ.: Netherlands  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*soil mechanics; experimental studies; equations; stress; consolidation; mechanism; loading; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 1102766 82-24693  
**Modelling and analysis of cyclic behavior of sands**  
 Ghabezis, J.; Momen, M.  
 Univ. Ill., Urbana, IL, USA  
**Soils under cyclic and transient loading**  
 Pande, G. N. (EDITOR); Zienkiewicz, O. C. (EDITOR)  
 Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
 International symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
 Publ. A. A. Balkema  
 1. 2. 299-300p. 1980  
 ISBN 90-6191-076-5  
 Subfile B  
 Country of Publ.: Netherlands  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*soil mechanics; materials; properties; compressibility; finite element analysis; statistical methods; loading; behavior; sand; clastic sediments; analysis; models; deformation; stress; materials; properties; triaxial tests; cyclic tests  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 1102758 82-24503  
**A non-linear model for the elastic behaviour of granular materials under repeated loading**
- 1102757 82-25268  
**Effect of work hardening rules on the elasto-plastic matrix**  
 Wen-ki Huang  
**Soils under cyclic and transient loading**  
 Pande, G. N. (EDITOR); Zienkiewicz, O. C. (EDITOR)  
 Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
 International symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
 Publ. A. A. Balkema  
 1. 2. 277-287p. 1980  
 ISBN 90-6191-076-5 8 REFS  
 Subfile B  
 Country of Publ.: Netherlands  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*soil mechanics; experimental studies; effects; finite element analysis; statistical methods; strain; stress; work hardening rule  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 1102756 82-25268  
**Effect of work hardening rules on the elasto-plastic matrix**  
 Wen-ki Huang  
**Soils under cyclic and transient loading**  
 Pande, G. N. (EDITOR); Zienkiewicz, O. C. (EDITOR)  
 Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
 International symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
 Publ. A. A. Balkema  
 1. 2. 277-287p. 1980  
 ISBN 90-6191-076-5 8 REFS  
 Subfile B  
 Country of Publ.: Netherlands  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*soil mechanics; materials; properties; cohesionless materials; granular materials; loading; behavior; models; pressure; stress; elasticity; equations; Poisson's ratio; elastic constants; triaxial tests; finite element analysis; statistical methods; materials; properties; non-linear behavior  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102756 82-25031

**Finite element solution of boundary value problems in soil mechanics**

Prevost, J. H.; Hughes, T. J. R.  
Princeton Univ., Princeton, NJ, USA; Calif. Inst. Technol., Pasadena, CA, USA

**Soils under cyclic and transient loading**

Paolo, G. N. (EDITOR); Zielenkiewicz, O. C. (EDITOR)  
Univ. Coll. Swansea, Dep. Civ. Eng., Swansea, GBR  
International Symposium on soils under cyclic and transient loading, Swansea, United Kingdom, Jan. 7-11, 1980  
Publ. A. A. Balkema  
1, 2, 263 276p., 1980  
ISBN 90-6191-076-5 24 REFS.  
Subfile B  
Country of Publ. Netherlands  
Doc Type BOOK; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
illus. 2 tables

Descriptors: soil mechanics; applications; cyclic loading; finite element analysis; statistical methods; equations; shear modulus; elastic constants  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102672 82-24487

**A structural approach to shaft design for deep mines in hard rock**

Beug, M. J.; Chan, S. S. M.  
U. S. Bur. Mines, Spokane, WA, USA; Univ. Idaho, Boise, ID, USA

**The state of the art in rock mechanics**

Summers, D. A. (Chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on rock mechanics, Rolla, MO, United States, May 28-30, 1980  
Proceedings: Symposium on Rock Mechanics 21, 780-786p., 1980  
CODEN PRRMAG ISSN 0586-3031 10 REFS.  
Subfile B  
Country of Publ. United States  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
illus. 6 tables

Descriptors: rock mechanics; materials; properties; mining; hard rock; design; Idaho; United States; Coeur d'Alene; finite element analysis; statistical methods; stability; pressure; materials; properties  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102656 82-24498

**Statistical analysis and modeling of the physical, mechanical, and strength properties of oil shale**

Bondurant, E. J.; Chang, N. Y.  
Univ. Colo., Boulder, CO, USA

**The state of the art in rock mechanics**

Summers, D. A. (Chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on rock mechanics, Rolla, MO, United States, May 28-30, 1980  
Proceedings: Symposium on Rock Mechanics 21, 604-613p., 1980  
CODEN PRRMAG ISSN 0586-3031 11 REFS.  
Subfile B  
Country of Publ. United States  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
5 tables, sketch map

Descriptors: rock mechanics; materials; properties; statistical analysis; physical properties; mechanical properties; strength; oil shale; uniaxial tests; triaxial tests; materials; properties; Colorado; United States; Piceance Creek basin; models  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102552 82-24857

**Analysis of the spatial variations in rock mass properties through geostatistics**

Lafontaine, P. R.  
Univ. Wis. Dep. Metall. Min. Eng., Madison, WI, USA

**The state of the art in rock mechanics**

Summers, D. A. (chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on rock mechanics. Rolla, MO, United States  
May 28-30, 1980  
Proceedings - Symposium on Rock Mechanics 21, 570-580p.  
1980

CODEN: PSRMA6 ISSN: 0586-3031 30 REFS.

Subfile B  
Country of Pub.: United States  
Doc. Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.

Descriptors: rock mechanics; materials; properties; spatial distribution; joints; fractures; models; design; materials; properties; Wisconsin; United States; Lannon; statistics; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1107624 82-24953

**Analytic subsidence model using void-volume distribution functions**

Munson, D. E.; Bouzley, S. E.  
Sandia Lab., Albuquerque, NM, USA

**The state of the art in rock mechanics**

Summers, D. A. (chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on rock mechanics. Rolla, MO, United States  
May 28-30, 1980  
Proceedings - Symposium on Rock Mechanics 21, 299-307p.  
1980

CODEN: PSRMA6 ISSN: 0586-3031 20 REFS.

Subfile B  
Country of Pub.: United States  
Doc. Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus., 1 table

Descriptors: rock mechanics; land subsidence; failures; mines; models; mechanism; materials; properties; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102609 82-24510

**Thermomechanical assessment of compensated CAES caverns in hard rock**

Brandshaud, T.  
RT/SPEC, Rapid City, SD, USA

**The state of the art in rock mechanics**

Summers, D. A. (chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on rock mechanics. Rolla, MO, United States  
May 28-30, 1980  
Proceedings - Symposium on Rock Mechanics 21, 163-174p.  
1980

CODEN: PSRMA6 ISSN: 0586-3031 13 REFS.

Subfile B  
Country of Pub.: United States  
Doc. Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus., 1 table

Descriptors: rock mechanics; underground installations; elasticity; excavations; finite element analysis; compressed air energy storage; caverns; solution features; geomorphology; statistical methods; stress; thermal conductivity; Young's modulus; elastic constants; Poisson's ratio  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102605 82 24842

**Rock slotting by high pressure water jet for use in tunneling**

ET GARD A  
Univ. Mo., Rolla, MO, USA

**The state of the art in rock mechanics**

Summers, D. A. (Chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on Rock Mechanics, Rolla, MO, United States  
May 28-30, 1980  
Proceedings - Symposium on Rock Mechanics 21, 123-131p.,  
1980

CODEN PSMAG ISSN 0586-3031 5 REFS.  
Subfile B  
Country of Publ. United States  
Doc. Type SERIAL, CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages English  
illus. 2 tables  
Descriptors rock mechanics; tunnels; experimental studies; excavations; drilling; stress; finite element analysis; statistical methods; jet slotting; young's modulus; elastic constants; Poisson's ratio; compressive strength; strength; density; design; feasibility studies  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102601 82 25036

**Effects of waterjet slotting on roller cutter forces**

Reinhart, R. S., Reimer, D. W.  
Flow Pac. Co., Kent, WA, USA

**The state of the art in rock mechanics**

Summers, D. A. (Chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on Rock Mechanics, Rolla, MO, United States  
May 28-30, 1980  
Proceedings - Symposium on Rock Mechanics 21, 96-97p.,  
1980

CODEN PSMAG ISSN 0586-3031 14 REFS.  
Subfile B  
Country of Publ. United States  
Doc. Type SERIAL, CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages English  
illus. 2 tables  
Descriptors rock mechanics; elasticity; finite element analysis; blasting; loading; statistical methods; shear strength; failures  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102600 82 24985

**Parametric thermal/thermoelastic analyses of nuclear waste repositories in granite and other non-salt rock types**

Ostes, J. D.; Wagner, R. A.; Waldman, H.  
PI/SPEC, Rapid City, SD, USA

**The state of the art in rock mechanics**

Summers, D. A. (Chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on Rock Mechanics, Rolla, MO, United States  
May 28-30, 1980  
Proceedings - Symposium on Rock Mechanics 21, 73-83p.,  
1980

CODEN PSMAG ISSN 0586-3031 29 REFS.  
Subfile B  
Country of Publ. United States  
Doc. Type SERIAL, CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages English  
illus. 2 tables  
Descriptors rock mechanics; waste disposal; elasticity; radioactive waste; finite element analysis; land use; analysis; loading; in situ; stress; failures; statistical methods; granite; granite granodiorite family; Poisson's ratio; elastic constants  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102599 82-25003

**Inexpensive but technically sound mine pillar design analysis**

Pariseau, W. G.  
Univ. Utah, Salt Lake City, UT, USA

**The state of the art in rock mechanics**

Summers, D. A. (chairperson)  
Univ. Mo., Rolla, MO, USA

21st Symposium on rock mechanics. Rolla, MO, United States  
May 28-30, 1980

Proceedings - Symposium on Rock Mechanics 21, 57-72p.  
1980

CODEN: PSRMAG ISSN: 0586-3031 7 REFS.

Subfile: B

Country of Publ.: United States

Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC

Languages English

illus. 3 tables

Descriptors: rock mechanics; experimental studies; stability; pillars; analysis; mines; design; algorithms; underground installations; stress; three-dimensional models; models; equations; finite element analysis; statistical methods; automatic data processing; methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102598 82-25011

**3-D structural analysis of longwall panels**

Feig, S. S.; Matsuki, K.; Su, W. H.  
W Va. Univ., Dep. Min. Eng., Morgantown, WV, USA

**The state of the art in rock mechanics**

Summers, D. A. (chairperson)  
Univ. Mo., Rolla, MO, USA

21st Symposium on rock mechanics. Rolla, MO, United States  
May 28-30, 1980

Proceedings - Symposium on Rock Mechanics 21, 44-56p.  
1980

CODEN: PSRMAG ISSN: 0586-3031 5 REFS.

Subfile: B

Country of Publ.: United States

Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC

Languages English

illus. 5 tables

Descriptors: rock mechanics; materials; properties; finite element analysis; three-dimensional models; models; analysis; statistical methods; Young's modulus; elastic constants; longwall panels; effects; packwall materials; stress; design; materials; properties; Poisson's ratio

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102597 82-24776

**Stress analysis in underground extraction of steeply dipping thick coal seams**

Jeremic, M. L.; Lutley, H. J.  
Univ. Alberta, Dep. Min. Eng., Edmonton, AB, CAN

**The state of the art in rock mechanics**

Summers, D. A. (chairperson)  
Univ. Mo., Rolla, MO, USA

21st Symposium on rock mechanics. Rolla, MO, United States  
May 28-30, 1980

Proceedings - Symposium on Rock Mechanics 21, 35-43p.  
1980

CODEN: PSRMAG ISSN: 0586-3031 6 REFS.

Subfile: B

Country of Publ.: United States

Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC

Languages English

illus. 2 tables

Descriptors: rock mechanics; excavations; analysis; Alberta; Canada; British Columbia; engineering geology; economic geology; coal; organic residues; reserves; uniaxial tests; triaxial tests; Young's modulus; elastic constants; Poisson's ratio; finite element analysis; statistical methods; stress; stability; automatic data processing

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102596 82-24725

**Time-dependent closure analysis of a nuclear waste repository in bedded salt**

Harrington, T. J.  
D'Appolonia Consult. Eng., Albuquerque, NM, USA

**The state of the art in rock mechanics**

Summers, D. A. (chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on rock mechanics, Rolla, MO, United States  
May 28-30, 1980

Proceedings - Symposium on Rock Mechanics 21, 26-34p., 1980

CODEN PSRMA6 ISSN 0586-3031 12 REFS  
Subfile B  
Country of Publ.: United States  
Doc. Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC

Languages: English  
illus.: 2 tables  
Descriptors: rock mechanics; waste disposal; materials; properties; site exploration; salt; Salado Formation; New Mexico; United States; Delaware Basin; engineering geology; radioactive waste; finite element analysis; statistical methods; materials; properties; Young's modulus; elastic constants; Poisson's ratio; underground installations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102594 82-24805

**Finite element analysis of a longwall mine**

Keith, H. D.; Batta, R. C.; Conroy, P. J.  
Univ. Mo., Rolla, MO, USA; Dames Moore, Park Ridge, IL, USA

**The state of the art in rock mechanics**

Summers, D. A. (chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on rock mechanics, Rolla, MO, United States  
May 28-30, 1980

Proceedings - Symposium on Rock Mechanics 21, 9-15p., 1980

CODEN PSRMA6 ISSN 0586-3031 3 REFS  
Subfile B  
Country of Publ.: United States  
Doc. Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC

Languages: English  
illus.: 1 table  
Descriptors: rock mechanics; case studies; finite element analysis; statistical methods; mines; three-dimensional models; Illinois; United States; Benton; coal fields  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102593 82-25241

**Stability comparisons of longwall panel entries using finite element analysis**

Van Dillen, D. E.; Ko, K. C.; Jenkins, F. M.; Karwowski, W.  
Aghabian Assoc., El Segundo, CA, USA; Kenneth C. Ko Assoc., Englewood, CO, USA

**The state of the art in rock mechanics**

Summers, D. A. (chairperson)  
Univ. Mo., Rolla, MO, USA  
21st Symposium on rock mechanics, Rolla, MO, United States  
May 28-30, 1980

Proceedings - Symposium on Rock Mechanics 21, 1-8p., 1980

CODEN PSRMA6 ISSN 0586-3031 11 REFS.  
Subfile B  
Country of Publ.: United States  
Doc. Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC

Languages: English  
illus.: 1 table  
Descriptors: rock mechanics; experimental studies; finite element analysis; statistical methods; three-dimensional models; models; stability; excavations; underground installations; design  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102454 82-25168

**Prediction of frequency and amplitude of foundations at resonance**

Sridharan, A.; Nagendra, M. V.  
Indian Inst. Sci., Dep. Civ. Eng., Bangalore, IND  
Canadian Geotechnical Journal-Revue Canadienne de Geotechnique 18, 4, 603-607p., 1981

CODEN CGJDAI ISSN 0008-3674 11 REFS.

Subfile B  
Country of Publ.: Canada  
Doc. Type SERIAL: Bibliographic Level: ANALYTIC  
Languages: English  
3 tables

Descriptors: foundations; soil mechanics; stability; deformation; vibration; prediction; statistical analysis; frequency; displacements; machinery; regression analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1102449 82-24869  
**Effectiveness of seepage control elements for embankments on semipervious foundations**  
 Lefebvre, G.; Lupien, C.; Pare, J. J.; Tournier, J.  
 Univ. Sherbrooke, Dep. Civ. Eng., Sherbrooke, PQ, CAN; Soc. Energ. James Bay, CAN  
 Canadian Geotechnical Journal=Revue Canadienne de Geotechnique 18, 4, 572-576p., 1981  
 CODEN CGJDAH ISSN: 0008-3674 6 REFS.  
 Subfile: B  
 Country of Publ.: Canada  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus.

Descriptors: \*dams; \*foundations; \*soil mechanics; materials; properties; seepage; permeability; embankments; semipervious materials; finite element analysis; statistical methods; control methods; materials, properties; anisotropy  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1101767 82-24765

**Seismic aspects of Taleghan Dam**  
 Islami, A. A.  
 Tehran Univ., Inst. Geophys., Tehran, IRN  
 J. Earth Space Phys. (Tehran) 9, 1-2, 5-10p., 1980  
 CODEN JESPCS 6 REFS.  
 Subfile: B  
 Country of Publ.: Iran  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: English; Portuguese  
 illus., 2 tables  
 Latitude: N340000; Longitude: E0540000; E0480000  
 Descriptors: \*Iran; \*seismology; engineering geology; earthquakes; dams; seismicity; Asia; Taleghan Dam; aseismic design; least-squares analysis; statistical methods; intensity; attenuation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1101741 82-24836

**Statistical estimation of compression index**  
 Koppula, S. D.  
 Hardy Assoc., Edmonton, AB, CAN  
 ASTM Geotechnical Testing Journal 4, 2, 68-73p., 1981  
 CODEN GTJDDJ ISSN: 0149-6115 10 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., 7 tables  
 Descriptors: \*Alberta; \*soil mechanics; engineering

1101281 82-24625

**Probabilistic treatment of faulting in geologic media**  
 Donath, F. A.; Cranwell, R. M.  
 Univ. Ill., Urbana, IL, USA; Sandia Lab., USA

**Mechanical behavior of crustal rocks; (the Hardin volume)**  
 Carter, N. L. (EDITOR); Friedman, M. (EDITOR); Logan, J. M. (EDITOR); Stearns, D. W. (EDITOR)  
 Tex. ASM Univ., Cent. Tectonophys., College Station, TX, USA  
 Geophysical Monograph 24, 231-241p., 1981  
 CODEN GPMGAD ISSN: 0065-8448 12 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., 1 table  
 Descriptors: \*faults; \*waste disposal; geologic hazards; displacements; radioactive waste; active faults; prediction; rock mechanics; probability; stress; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1100688 82-24619

**Otsenka pogreshnostey laboratornykh opredeleniy prochnostnykh kharakteristik porod**  
**Analyzing errors in laboratory studies of rock strengths**

Dikovskiy, A. L.  
 Vyssh. Uchebn. Zaved., Izv., Geol. Razved. 1980, 7, 74-77  
 P., 1980  
 CODEN IVUGAF ISSN: 0016-7762 3 REFS.  
 Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Russian  
 illus.

Descriptors: \*rock mechanics; materials; properties; strength; statistical analysis; laboratory studies; materials, properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1099582 82 24496

**Managing localized erosion of coastal bluffs**

Bouhassira, M.; Tanis, J.  
State Univ. N. Y., Mar. Sci. Res. Cent., Stony Brook, NY, USA

**Coastal zone '80**

Edge, P. I. (EDITOR)  
Second Symposium on coastal and ocean management,  
Hollywood, FL, United States, Nov. 17-20, 1980  
Proceedings of the Symposium on Coastal and Ocean Management  
2, Vol. 3, 1981-1856p., 1980  
11 REFS

Subfile B  
Country of Publ.: United States  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages English  
illus. Sketch map  
Descriptors: geomorphology; New York; shore features;  
engineering geology; bluffs; shorelines; erosion;  
management; Long Island; United States; statistical  
analysis; stabilization  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1099372 82 25046

**Gravitational spreading of steep-sided ridges (''sacking'')**  
**in western United States**

Radbruch-Hall, D. H.; Varnes, D. J.; Savage, W. Z  
U. S. Geol. Surv., Menlo Park, CA, USA

**Section 13: The contribution of geology towards management  
of the environment**

Jacobson, G. (convener)  
Bur. Miner. Resour., Canberra, AUS  
25th International geological congress., Sydney, Australia,  
Aug. 16-25, 1976  
Int. Assoc. Eng. Geol., Bull. 14, 23-35p., 1976  
CODEN BIEGR6 ISSN: 0074-1612 20 REFS.

Subfile B  
Country of Publ.: International  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages English Summary Languages French  
illus. sketch map  
Descriptors: Western U.S.; geomorphology; engineering  
geology; mass movements; slope stability; sacking;  
Gunnison County; Larimer County; Mancos Shale; Stillwater  
Complex; United States; gravity sliding; Rocky Mountains;  
North America; tectonics; Dolores Peak; Mount Massive;  
Crested Butte; Colorado; fractures; shale; clastic rocks;  
Montana; Loveland; Shrine Mountain; Bald Mountain; Mount  
Nash; finite element analysis; statistical methods; shear  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1099133 82-18903

**Pouziti statistické entropie při interpretaci výsledku  
merení metodou nabitého telesa na sypných hrazích**  
**The application of statistical entropy in the interpretation  
of electrical potential measurements in unconsolidated slopes**

Landa, I.; Skuthan, B.  
Geol. Průzkum 19: 8, 243-245p., 1977  
CODEN: GEIPAH ISSN: 0016-772X

Subfile B  
Country of Publ.: Czechoslovakia  
Doc Type SERIAL Bibliographic Level: ANALYTIC  
Languages Czech  
illus. 1 tables, sketch maps  
Descriptors: Czechoslovakia; geophysical methods; ground  
water; geophysical surveys; engineering geology;  
electrical methods; surveys; electrical surveys; slope  
stability; interpretation; Europe; statistical analysis;  
entropy; hydrodynamics; Hracholusky  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1098326 82-19290

**Slope process monitoring and data analysis, Texas Panhandle**  
Finley, R. J.; Howard, R. C.  
Tex. Bur. Econ. Geol., Austin, TX, USA; Tex. Bur. Econ. Geol., USA

**Geology and geohydrology of the Palo Duro Basin, Texas Panhandle; a report on the progress of nuclear waste isolation feasibility studies (1980); annual report for period October, 1979 - September 30, 1980**

Gustavson, T. C.; Bassett, R. L.; Finley, R. J.; Goldstein, A. G.; Handford, C. R.; McGowen, J. H.; Presley, M. W.; Baumgardner, R. W., Jr.; Bentley, M. E.; Dutton, S. P.; Griffin, J. A.; Hoadley, A. D.; Howard, R. C.; McGookey, D. A.; McGillis, K. A.; Palmer, D. P.; Ramondetta, P. J.; Roedler, E.; Simpkins, W. W.; Wiggins, W. D.  
Univ. Tex. at Austin, Austin, TX, USA  
Geological Circular, Texas, University, Bureau of Economic Geology, 81-3, 144-147p., 1981  
CODEN TEGCA3 ISSN OOR2-3309

Subfile B  
Country of Publ.: United States  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages English

Descriptors: \*Texas; \*automatic data processing; \*geomorphology; \*engineering geology; \*processes; \*waste disposal; \*erosion features; \*erosion; \*United States; \*radioactive waste; \*Great Plains; \*North America; \*Panhandle; \*studies; \*statistical analysis; \*rates  
Section Headings 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

1098326 82-16271

**Statistical analysis of lithologic interpretations from well logs**  
Presley, M. W.  
Tex. Bur. Econ. Geol., Austin, TX, USA; Tex. Bur. Econ. Geol., USA

**Geology and geohydrology of the Palo Duro Basin, Texas Panhandle; a report on the progress of nuclear waste isolation feasibility studies (1980); annual report for period October, 1979 - September 30, 1980**

Gustavson, T. C.; Bassett, R. L.; Finley, R. J.; Goldstein, A. G.; Handford, C. R.; McGowen, J. H.; Presley, M. W.; Baumgardner, R. W., Jr.; Bentley, M. E.; Dutton, S. P.; Griffin, J. A.; Hoadley, A. D.; Howard, R. C.; McGookey, D. A.; McGillis, K. A.; Palmer, D. P.; Ramondetta, P. J.; Roedler, E.; Simpkins, W. W.; Wiggins, W. D.  
Univ. Tex. at Austin, Austin, TX, USA  
Geological Circular, Texas, University, Bureau of Economic Geology, 81-3, 144-147p., 1981  
CODEN TEGCA3 ISSN OOR2-3309  
Subfile B

Country of Publ.: United States  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages English

Descriptors: \*Texas; \*engineering geology; \*geophysical surveys; \*waste disposal; \*well-logging; \*Panhandle County; \*Swisher County; \*Ginrieta Formation; \*San Andres formation; \*United States; \*radioactive waste; \*statistical analysis; \*Palo Duro Basin; \*salt; \*lithofacies; \*Permian Basin; \*Panhandle; \*Great Plains; \*North America; \*underground space; \*interpretation; \*lithostratigraphy; \*SEDIMENTARY  
Section Headings: 06 (PETROLOGY, SEDIMENTARY)

1097970 82-18998

**Sposob opredeleniya vodonasyshchennosti i glinistosti porody A means of determining the degree of water saturation and clay content of rocks**

Orlov, I. I.; Karbov, Y. N.; Topnikov, V. G.  
Neftegazovaya Geologiya i Geofizika 1981 8, 17-20p., 1981  
CODEN NCGSAX ISSN 0028-1182

Subfile B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages Russian

Descriptors: \*geochemistry; \*engineering geology; \*properties; \*petroleum engineering; \*physicochemical properties; \*reservoir rocks; \*clay mineralogy; \*saturation; \*statistical analysis; \*petroleum; \*natural gas; \*evaluation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1097914 82-18715

**Discussion of "state of the art: laboratory strength testing of soils"**

Christian, J. T.  
Stone Webster Eng. Corp., Boston, MA, USA

**Laboratory shear strength of soil**

Young, R. N. (EDITOR); Townsend, F. C. (EDITOR)  
Laboratory shear strength of soil, Chicago, IL, United States, June 25, 1980  
ASTM Special Technical Publication=American Society for Testing and Materials Special Technical Publication 740, 638-640p., 1981  
CODEN ASTIAB ISSN 0066-0558 3 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English

Note for reference to original article by Saada, A. S. and Townsend, F. C. See Symp. on Lab. Shear Strength of Soil, Chicago, Ill., p. 7-77, 1980.  
Descriptors: soil mechanics; materials; properties; shear strength; finite element analysis; statistical methods; loading; applications; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1096984 82-19090

**Regional characteristics of tsunamis along Pacific Coast of Hokkaido**

Takahashi, S.; Yakuwa, I.  
Natural Disaster Science 1 1, 51-66p., 1979  
12 REFS.

Subfile: B  
Country of Publ.: Japan  
Doc Type SERIAL: Bibliographic Level ANALYTIC  
Languages: English  
illus.: 5 tables, sketch maps  
Descriptors: Japan; seismology; engineering geology; earthquakes; geologic hazards; tsunamis; Asia; wave analysis; Hokkaido; prediction; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1096941 82-19020

**Nonlinear anisotropic stress-strain-strength behavior of soils**

Prevost, J. H.  
Princeton Univ., Dep. Civ. Eng., Princeton, NJ, USA; Univ. Fla., Gainesville, FL, USA

**Laboratory shear strength of soil**

Young, R. N. (EDITOR); Townsend, F. C. (EDITOR)  
McGill Univ., Montreal, PQ, CAN  
Laboratory shear strength of soil, Chicago, IL, United States, June 25, 1980  
ASTM Special Technical Publication=American Society for Testing and Materials Special Technical Publication 740, 431-455p., 1981  
CODEN ASTIAB ISSN 0066-0558 27 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
illus.: 2 tables

Descriptors: soil mechanics; applications; engineering properties; shear strength; stress; strain; behavior; consolidation; porous materials; pore pressure; deformation; equations; materials, properties; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1096798 82-18627

**Consequence of an earthquake prediction on statistical estimates of seismic risk**

Anderson, J. G.  
Univ. Calif. at San Diego, Dep. Appl. Mech. and Eng. Sci., La Jolla, CA, USA  
Bulletin of the Seismological Society of America 71: 5, 1637-1648p., 1981  
CODEN BSSAAP ISSN 0037-1106 25 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type SERIAL: Bibliographic Level ANALYTIC  
Languages: English  
illus.: 1 table, sketch map

Latitude: N344500; N344500 Longitude: W1174000; W1185000  
Descriptors: seismology; earthquakes; geologic hazards; prediction; seismic risk; Los Angeles County; statistical analysis; case studies; California; United States; Southern California; active faults; faults; engineering geology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1066291 82-17032

**A simple and efficient method for introducing faults into finite element computations**

Malesh, H. J., Raefsky, A.  
State Univ. N.Y., Dep. Earth and Space Sci., Stony Brook, N.Y., USA  
Bulletin of the Seismological Society of America 71: 5, 1991, 140pp., 1981  
CODEN PSSAAP ISSN 0037-1106 16 REFS  
Subfile B  
Country of Publ. United States  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages English  
illus.

Descriptors: faults; seismology; rock mechanics; theoretical studies; numerical analysis; strain relaxation; finite element analysis; statistical methods; earthquakes; stick slip mechanics  
Section Headings 19 (GEOPHYSICS, SEISMOLOGY)

1066298 82-18539

**Probabilistic approach to deformation and strength properties of shale mass**

Kulatilake, P. H. S. W.  
Ohio State Univ., Columbus, OH, USA  
1980, 1981  
Subfile B  
Degree Level Doctoral  
Country of Publ. United States  
Doc Type THESIS Bibliographic Level MONOGRAPHIC  
Languages English  
Availability Univ. Microfilms

Descriptors: rock mechanics; deformation; materials; properties; theoretical studies; shale; yield strength; Coenraugh Group; strength; probability; statistical analysis; geometry; Ohio; United States; Pennsylvania; Paleozoic; elastic rocks; materials; properties; young's modulus; elastic constants  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1066272 82-18535

**Finite element consolidation analyses of tunnel behavior in clay**

Johnston, P. R.  
Stanford Univ., Stanford, CA, USA  
276p., 1981  
Subfile P  
Degree Level Doctoral  
Country of Publ. United States  
Doc Type THESIS Bibliographic Level MONOGRAPHIC  
Languages English

Availability: Univ. Microfilms  
Descriptors: soil mechanics; tunnels; settlement; consolidation; finite element analysis; statistical methods; clay; clastic sediments; cohesive materials; loading  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1095957 82-18675

**Makopleniye i obrabotka inzhenerno-geologicheskoy informatsii**  
Accumulation and development of engineering geological work  
Bondarik, G. K.

**Spravochnik po inzhenernoy geologii**  
A handbook of engineering geology

Churincev, M. V. (EDITOR)  
Publ. Izd. Nedra  
203-216p., 1981  
Ed. 3 B REFS.  
Subfile B  
Country of Publ. Union of Soviet Socialist Republics  
Doc Type BOOK Bibliographic Level ANALYTIC  
Languages Russian  
illus. 7 tables

Descriptors: automatic data processing; engineering; laboratory studies; data  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1094979 82 19079

**Raschet napryazhenno-deforyirovannogo sostoyaniya sistem tselik krovaliya-pochva metodoy konechnykh elementov**  
**Computation of stress in pillar-root-floor systems by finite element analysis**  
 Shkarpeta, V. P.

**Mekhanika gornyykh porod**  
**Advanced rock mechanics**

Borisov, A. A (EDITOR)  
 Leningrad, Gorn. Inst., Zap. 82, 91-95p., 1980  
 COBEN ZHIZNAY ISSN 0135-9500 4 REFS.

Subfile B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc. Type: SERIAL Bibliographic Level: ANALYTIC

Languages: Russian  
 illus.

Descriptors: rock mechanics; mining geology; theoretical studies; practice; stress; roof control; pillars; finite element analysis; statistical methods  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1094967 82 18416

**Modelling of soil-structure interaction by finite and infinite elements**

Medina, F.  
 Report - Earthquake Engineering Research Center, College of Engineering, University of California, Berkeley, California 80-43, 6p., 1980

ISSN 0271-0223 25 REFS.

Subfile B  
 Country of Publ.: United States

Doc. Type: SERIAL Bibliographic Level: MONOGRAPHIC  
 Languages: English

Availability: NIS, Springfield, VA, United States  
 illus.; 1 table

Descriptors: soil mechanics; foundations; theoretical studies; mathematical methods; mathematical models; models; infinite models; finite element analysis; statistical methods; seismic response; infinite element analysis  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1094811 82 18661

**Free response of shells on flexible foundation**

Belikov, P. M.; Vlas, J. C.

**International conference on recent advances in geotechnical earthquake engineering and soil dynamics, Vol. II**

Prakash, S. (EDITOR)

International Conference on recent advances in geotechnical earthquake engineering and soil dynamics, St. Louis, MO.

United States, Apr. 26-May 3, 1981

Publ. Univ. Mo. at Rolla

805 808p., 1981

3 REFS.

Subfile B

Country of Publ.: United States

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.; 9 tables

Descriptors: soil mechanics; foundations; elasticity; piles; earthquakes; finite element analysis; statistical methods; velocity; Poisson's ratio; elastic constants; shear modulus  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1094832 82 18711

**Stiffness coefficients for embedded footings**

Chirkhalapapa, L. S.

**International conference on recent advances in geotechnical earthquake engineering and soil dynamics, Vol. II**

Prakash, S. (EDITOR)

International Conference on recent advances in geotechnical earthquake engineering and soil dynamics, St. Louis, MO.

United States, Apr. 26-May 3, 1981

Publ. Univ. Mo. at Rolla

735-736p., 1981

4 REFS.

Subfile B

Country of Publ.: United States

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: soil mechanics; foundations; elasticity; piles; footings; finite element analysis; statistical methods; stiffness coefficients; earthquakes  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

100791R 82 18731

**Behavior of interfaces between structural and geologic media**

Desai, D. S.  
Va Polytech. Inst. & State Univ., Dep. Civ. Eng.,  
Blacksburg, VA, USA

**International conference on recent advances in geotechnical earthquake engineering and soil dynamics; Vol. II**

Prakash, S. (EDITOR)  
International conference on recent advances in geotechnical earthquake engineering and soil dynamics, St. Louis, MO, United States, Apr 26-May 3, 1981  
Publ. Univ. Mo. at Rolla  
619-638D., 1981  
6R REFS.

Subfile B  
Country of Publ: United States  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus

Descriptors: soil mechanics; deformation; loading; earthquakes; foundations; buildings; finite element analysis; statistical methods; shear; torsion; models; stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

100792 82-1898G

**Analysis of dynamic shear strain distributed in three dimensional earthdam models**

Dimachti, I

**International conference on recent advances in geotechnical earthquake engineering and soil dynamics; Vol. I**

Prakash, S. (EDITOR)  
International conference on recent advances in geotechnical earthquake engineering and soil dynamics, St. Louis, MO, United States, Apr 26 May 3, 1981  
Publ. Univ. Mo. at Rolla  
459-464p., 1981  
5 REFS.

Subfile B  
Country of Publ: United States  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus; 3 tables

Descriptors: dams; site exploration; soil mechanics; earth dams; shear; three-dimensional models; models; strain; finite element analysis; statistical methods; vibration; earthquakes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1093786 82-18916

**Seismic deformation of dams by correlative methods**

Lin, Y. K.; Rodda, K. V.; Perry, C. W.; Gill, D. K.  
Wahler Assoc., Palo Alto, CA, USA; Santa Clara Val. Water Dist., San Jose, CA, USA

**International conference on recent advances in geotechnical earthquake engineering and soil dynamics; Vol. I**

Prakash, S. (EDITOR)  
International conference on recent advances in geotechnical earthquake engineering and soil dynamics, St. Louis, MO, United States, Apr. 26-May 3, 1981  
Publ. Univ. Mo. at Rolla  
425-430p., 1981  
10 REFS.

Subfile B  
Country of Publ: United States  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus; 4 tables

Descriptors: California; engineering geology; dams; earthquakes; deformation; seismic response; United States; Gundalupé Dam; Calero Dam; Almaden Dam; finite element analysis; statistical methods; Santa Clara Valley; triaxial tests

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1033775 82 19138

**Method of influence function and its application**

Wang, Y. S.; Wang, K. C.; Ho, T. Q.

**International conference on recent advances in geotechnical earthquake engineering and soil dynamics; Vol 1**

Prakash, S. (EDITOR)

International conference on recent advances in geotechnical earthquake engineering and soil dynamics. St. Louis, MO, United States, Apr. 26-May 3, 1981

355 358p.

1981

10 REFS

Subtitle B

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

illus.: 2 tables

Descriptors: foundations; piles; applications; methods; soil mechanics; earthquakes; influence functions; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1093760 82 18654

**Load settlement characteristics and bearing capacity of clays under transient loads**

Prasanna, P. M.; Prasad, S.; Arya, A. S.

**International conference on recent advances in geotechnical earthquake engineering and soil dynamics; Vol 1**

Prakash, S. (EDITOR)

International conference on recent advances in geotechnical earthquake engineering and soil dynamics. St. Louis, MO, United States, Apr. 26-May 3, 1981

203 289p.

1981

6 REFS

Subtitle B

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

illus.

Descriptors: soil mechanics; materials; properties; loading; transient loading; earthquakes; clay; elastic sediments; finite element analysis; statistical methods; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1093741 82 19786

**Uniform cycles in earthquakes; a statistical study**

Holzer, A.

Geol. Inst. Technol., Sch. Civ. Eng., Atlanta, GA, USA

**International conference on recent advances in geotechnical earthquake engineering and soil dynamics; Vol. 1**

Prakash, S. (EDITOR)

International conference on recent advances in geotechnical earthquake engineering and soil dynamics. St. Louis, MO, United States, Apr. 26-May 3, 1981

Publ.: Univ. Mo. at Rolla

195; 198p.

1981

A REFS

Subtitle B

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

illus.: 1 table

Descriptors: soil mechanics; earthquakes; liquefaction; effects; loading; cyclic loading; stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1093654 82-19045

**An analytical method for determination of earth pressure acting on tunnel lining in viscoelastic medium**

Sakurai, S.

Rock Mechanics in Japan 2, 93-95p., 1974

1 REFS.

Subtitle B

Country of Publ.: Japan

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Language: English

illus.

Descriptors: tunnels; rock mechanics; excavations; earth pressure; creep; mechanics; methods; viscosity; elasticity; techniques; finite element analysis; statistical methods; slope stability; experimental studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1093348 82-19010  
**Zonizzazione sismica del Gargano: analisi statistiche**  
**Seismic zoning of Gargano: statistical analysis**  
Peronchi, M  
Riv. Geofis. Teor. Appl. 27 85. 23-28p. 1980  
CODEN BGTAEE ISSN 0006-6729  
Subfile B  
Country of Publ. Italy  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages Italian Summary Languages English  
2 tables, sketch map  
Latitude N404000; Longitude E0167000; E0147000  
Descriptors Italy; \*seismology; engineering geology;  
earthquakes; seismic risk; Europe; statistical analysis;  
Gargano; seismic zoning  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1093321 82-19018  
**Sedimentology, geochemistry and discriminant analysis in the**  
**engineering geological investigation of damsites, lower Gordon**  
**area, Tasmania**  
Prasada Rao, C.; Nagvi, I. H  
Univ. Tasmania, Dep. Geol., Hobart, Tas., AUS.  
Hydro Electric Comm., AUS  
Journal of the Geological Society of Australia 28 2.  
141-15p. 1981  
CODEN JGFSAD ISSN 0016-7614 33 REFS.  
Subfile B  
Country of Publ. Australia  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages English  
illus., sects., strat. cols., geol. sketch map  
Latitude S420000; Longitude E1450000; E1450000  
Descriptors Tasmania; sedimentation; \*sedimentary rocks;  
\*diapirsis; \*automatic data processing; sedimentary  
petrology; stratigraphy; lithostratigraphy; processes;  
dolomitization; engineering geology; Ordovician;  
environmental analysis; intertidal sedimentation; dams;  
Australia; discriminant analysis; statistical methods;  
folds; Paleozoic; anticlines; nearshore environment;  
models; Gordon River; lithofacies; micrite; carbonate  
rocks; sparite; Gordon Limestone; Butler Island formation;  
prosopity; serpage; chemical composition; sedimentary  
structures; limestone; dolostone  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1092073 82-14095  
**A model for slab foundations on expansive soils**  
Tsotsos, S. S.  
Proceedings of the Fourth International Conference on

**expansive soils: Characterization and treatment of expansive**  
**soils for engineering design**  
Sneath, D. R. (EDITOR)  
Okla. State Univ., Stillwater, Ok., USA  
Fourth international conference on expansive soils,  
Characterization and treatment of expansive soils for  
engineering design, Denver, CO, United States, June 16-18,  
1980  
Proceedings of the International Conference on Expansive  
Soils 4. 551-557p. 1980  
ISBN: 0-87262-245-2 8 REFS.  
Subfile B  
Country of Publ. United States  
Doc Type SERIAL CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages English  
Descriptors \*soil mechanics; \*foundations; materials;  
properties; expansive materials; models; finite element  
analysis; statistical methods; behavior; stress; strain;  
deformation; materials; properties  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1091672 82 13679

**Modeling climatic effects on clay beneath slabs**

Corley, J. R.  
Univ. Tex., Dep. Civ. Eng., Arlington, TX, USA

**Proceedings of the Fourth international conference on expansive soils: Characterization and treatment of expansive soils for engineering design**

Speitler, D. R. (EDITOR)

Oklahoma State Univ., Stillwater, OK, USA

Fourth international conference on expansive soils characterization and treatment of expansive soils for engineering design. Denver, CO, United States, June 16-18, 1980

Proceedings of the International Conference on Expansive

Soils 4, 533-550p, 1980

ISBN 0-97262-245-2 12 REFS.

Subfile B

Country of Publ. United States

Doc. Type SERIAL, CONFERENCE PUBLICATION Bibliographic

Level ANALYTIC

Language English

4 tables

Descriptors: automatic data processing; expansive materials; properties; soil mechanics; engineering geology; expansive materials; models; moisture; clay soils; soils; dams; finite element analysis; statistical methods; Darby's Law; for train; methods; materials; properties

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1092589 82 13288

**Two-phase flow simulation of air storage in an aquifer**

Warril, D.

MUS Corp., Rockville, MD, USA

Water Resources Research 17, 5, 1369-1365p, 1981

CODEN WRRRAQ ISSN 0043-1337 17 REFS.

Subfile B

Country of Publ. United States

Doc. Type SERIAL Bibliographic Level ANALYTIC

Language English

Descriptors: ground water; engineering geology; aquifers; materials; properties; compressed air; mathematical models; finite element analysis; statistical methods; storage; simulation; applications; two phase models; permeability; materials; properties

Section Headings 21 (HYDROGEOLOGY AND HYDROLOGY)

1091684 82 14048

**Landslide potential prediction for watersheds**

Simons, D. R., Ward, T. J., III, P.

Colorado State Univ., Dep. Civ. Eng., Fort Collins, CO, USA

**Hydraulic engineering for improved water management**

Friedrich, R. (EDITOR)

Seventeenth congress of the International Association for Hydraulic Research: Hydraulic engineering for improved water management, Baden-Baden, Germany, Federal Republic of,

Aug. 15-17, 1977

Int. Assoc. Hydraul. Res., Congr., Proc., 17, Vol. 6,

199-157p, 1977

CODEN PCIR03 12 REFS.

Subfile B

Country of Publ. Varies

Doc. Type SERIAL: CONFERENCE PUBLICATION Bibliographic

Level ANALYTIC

Language English Summary Languages: French

Illustrations: sketch maps

Descriptors: hydrology; slope stability; rivers and

streams; landslides; sediment yield; prediction;

watersheds; automatic data processing; engineering geology;

maps; cartography; probability; vegetation; Monte Carlo

analysis; shear strength

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1091527 82 13972

**A budai agyagok mernokgeologiai osszehasonlitas matematikai statisztikai alapon**

**Engineering geologic comparison of Buda clays by statistical analysis**

Pal, T.

Enghrt. Kozrtl., 106, 3, 229-256p., 1976

CODEN FOKOAG ISSN 0015-542X 20 REFS.

Subfile B

Country of Publ. Hungary

Doc. Type SERIAL Bibliographic Level: ANALYTIC

Language Hungarian

4 tables

Latitude N472000; N474000 Longitude: E0191500; E0190000

Descriptors: Hungary; soil mechanics; engineering

geology; materials; properties; clay; Europe; materials;

properties; elastic sediments; Budapest region; statistical

analysis

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1091503 82-13836

Nehany Salgotarjan környeki uledek kőzet talajfizikai jellemzőinek matematikai statisztikai vizsgálat  
Soil physical characteristics of some sedimentary rock samples from the Salgotarjan region based on statistical analysis

Keleti, J  
Foeldt, Kozel 108 2. 199-212p. 1978

CODEN FDKO49 ISSN 0015-542X

Subfile B

Country of Publ. Hungary

Doc Type SERIAL Bibliographic Level ANALYTIC

Languages Hungarian Summary Languages English

illus. 3 tables, sketch map

Latitude: N483000; N481000 Longitude: E0194500

Descriptors Hungary; soil mechanics; sedimentary rocks  
; stratigraphy; engineering geology; materials; properties  
; Cenozoic; statistical analysis; Europe; materials  
properties; Phanerozoic; lithostratigraphy; Salgotarjan

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1091290 82-13701

The use of geostatistics in high level radioactive waste repository site characterization

Doctor, P. G.

Battelle Pacific Northwest Lab., Richland, WA, USA

Radioactive Waste Management 1. 2. 193-210p. 1980

CODEN RWMADW ISSN: 0142-2405 17 REFS.

Subfile B

Country of Publ. International

Doc Type SERIAL Bibliographic Level ANALYTIC

Languages English

illus. 1 table, sketch maps

Latitude: N462500; N464500 Longitude: W1192500; W1195000

Descriptors Washington; ground water; maps; engineering geology; surveys; cartography; waste disposal; Benton County; Grant County; Franklin County; United States; radioactive waste; Hanford Atomic Energy Reservation  
; site exploration; basalt; basalt family; statistical analysis; levels; Pasco Basin

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1091054 82-14108

The finite element method applied to large elasto-plastic deformations of solids

Voyiadjis, G. Z

Univ. Pat. Miner., Dep. Civ. Eng., Dhahran, SAU

Arabian J. Sci. Eng. 4. 1. 41-46p. 1979

CODEN AJSEDEY ISSN: 0377-9711 9 REFS.

Subfile B

Country of Publ. Saudi Arabia

Doc Type SERIAL Bibliographic Level ANALYTIC

Languages English Summary Languages Arabic

illus

Descriptors rock mechanics; deformation; finite element analysis; statistical methods; methods; soil phase equations; elasticity; plasticity; stress; strain

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1090991 82-13891

Strength-index test of rocks from Iraq

Mashhour, M.; Berikani, M

Al-Mustansiriyah Univ., Dep. Appl. Geol., Baghdad, Iraq

Iraq J. Sci. 21. 2. 360-371p. 1980

ISSN: 0067-2904 10 REFS.

Subfile B

Country of Publ. Iraq

Doc Type SERIAL Bibliographic Level ANALYTIC

Languages English Summary Languages Arabic

illus. 1 table, sketch map

Descriptors Iraq; rock mechanics; engineering geology; materials; properties; strength; igneous rocks; metamorphic rocks; sedimentary rocks; rebound hardness; statistical analysis; materials; properties; Gercus Formation; Upper Fars Formation; Gahara Sandstone Formation

Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 1090561 82-13662  
**An empirical analysis of the source of energy release during the October 15, 1979 Imperial Valley earthquake**  
 Campbell, K. W.; Polit, M. W.  
 Terra Corp., Berkeley, CA, USA
- Seismological Society of America, 76th annual meeting**  
 Anonymous  
 Seismological Society of America, 76th annual meeting, Berkeley, CA, United States, March 23-25, 1981  
 Earthquake Notes 52:1, 85p., 1981  
 CODEN: EAGNAT ISSN: 0012-8287  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N374000; N333000 Longitude: W1161500; W1161500  
 Descriptors: California; seismology; engineering geology; earthquakes; geologic hazards; relaxation energy; Imperial County; United States; Southern California; Imperial Valley; statistical analysis; strong motion; ground motion; peak ground acceleration  
 Section Headings: 22 ENGINEERING & ENVIRONMENTAL GEOLOGY
- 1090557 82-13899  
**Analysis of incoherent energy in near field accelerograms**  
 McLaughlin, K. L.; Johnson, L. R.  
 Univ. Calif., Seismogr. Stn., Berkeley, CA, USA
- Seismological Society of America, 76th annual meeting**  
 Anonymous  
 Seismological Society of America, 76th annual meeting, Berkeley, CA, United States, March 23-25, 1981  
 Earthquake Notes 52:1, 83p., 1981  
 CODEN: EAGNAT ISSN: 0012-8287  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N370000; N373000 Longitude: W1161000; W1170000  
 Descriptors: Nevada; seismology; engineering geology; explosions; ground motion; Nye County; United States; Nevada Test Site; Pahute Mesa; accelerograms; near-field spectra; elastic waves; scattering; wave dispersion; raypaths; velocity; statistical analysis  
 Section Headings: 22 ENGINEERING & ENVIRONMENTAL GEOLOGY
- 1090540 82-13970  
**Probability that another intensity X event could occur in**
- the S. E. during a 200 year period**  
 Ormsby, M. R.  
 Ga. Inst. Technol., Sch. Geophys. Sci., Atlanta, GA, USA
- Seismological Society of America, 76th annual meeting**  
 Anonymous  
 Seismological Society of America, 76th annual meeting, Berkeley, CA, United States, March 23-25, 1981  
 Earthquake Notes 52:1, 74p., 1981  
 CODEN: EAGNAT ISSN: 0012-8287  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: Atlantic Coastal Plain; seismology; South Carolina; earthquakes; engineering geology; geologic hazards; seismic risk; Charleston County; North America; Southern Atlantic Coastal Plain; United States; Charleston; seismic intensity; probability; prediction  
 Section Headings: 22 ENGINEERING & ENVIRONMENTAL GEOLOGY
- 1090406 82-14032  
**Problems and pitfalls of using Bayesian models for seismic hazard analysis**  
 Schoof, C. C.; Mortgat, C. P.; Shah, H. C.  
 Stanford Univ., John A. Blume Earthquake Eng. Cent., Stanford, CA, USA
- Seismological Society of America, 76th annual meeting**  
 Anonymous  
 Seismological Society of America, 76th annual meeting, Berkeley, CA, United States, March 23-25, 1981  
 Earthquake Notes 52:1, 9p., 1981  
 CODEN: EAGNAT ISSN: 0012-8287  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: geologic hazards; earthquakes; automatic data processing; engineering geology; effects; seismic risk; California; United States; Central California; San Francisco Bay region; seismology; Bayesian analysis; statistical analysis  
 Section Headings: 22 ENGINEERING & ENVIRONMENTAL GEOLOGY

1089404 82-13717

**Estimates of intensities and damage for California earthquakes**

Evernden, J. F.  
U. S. Geol. Surv., Menlo Park, Ca., USA

**Seismological Society of America. 76th annual meeting**

Anonymous  
Seismological Society of America, 76th annual meeting,  
Berkeley, CA, United States, March 23-25, 1981  
Earthquake Notes 52, 1, 8p., 1981  
CODEN: EAOMAT ISSN: 0012-8287

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*California; \*seismology; earthquakes; engineering geology; geologic hazards; seismic intensity; Santa Barbara County; San Francisco County; United States; Central California; San Francisco Bay region; seismic risk; Southern California; Lompoc; damage; cost; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1089688 82-14112

**Filtration: an application of a statistical approach to filters and filter fabrics**

Wates, J. A.

**Proceedings of the Seventh regional conference for Africa on soil mechanics and foundation engineering**

Gidiqisu, M. D. (EDITOR); Hammond, A. A. (EDITOR); Gogo, J. O. (EDITOR)  
Seventh regional conference for Africa on soil mechanics and foundation engineering, Accra, Ghana, June 1980  
Soil Mech. Found. Eng., Reg. Conf. Afr., Proc. 7, 433-440  
P., 1980

CODEN: SMATBS ISBN: 90-6191-093-5 9 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
Illustrations: \*South Africa; engineering geology; dams; filtration; design; construction; tailings; Africa; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1089637 82-13719

**Statistical analysis of sand liquefaction**

Fardis, M. N.; Veneziano, D.  
Mass. Inst. Technol., Dep. Civ. Eng., Cambridge, MA, USA  
Journal of the Geotechnical Engineering Division 107: GT 10  
1361-1377p., 1981

CODEN: AUGER6 ISSN: 0093-6405 37 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

Illustrations: 3 tables  
Descriptors: \*soil mechanics; \*mathematical geology; materials; properties; methods; liquefaction; stochastic processes; sand; elastic sediments; Standard Penetration Test; shear stress; sample preparation; in situ; S-waves; pore pressure; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1089362 82-13866

**Fundamental studies on mechanical excavation of rock with roller cutters**

Kuriyagawa, M.; Misawa, S.; Hayamizu, H.  
Rock Mechanics in Japan 3, 146-148p., 1979  
Subfile: B

Country of Publ.: Japan  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

Illustrations: 1 table  
Descriptors: \*rock mechanics; failures; excavations; theoretical studies; experimental studies; mechanism; finite element analysis; statistical methods; stress; elasticity; plasticity; instruments  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1089351 82-13047

**Cave-in due to mining at shallow depths**

Nishida, T.; Kameda, N.  
 Rock Mechanics in Japan 3, 111-113p., 1979  
 Subfile B  
 Country of Publ.: Japan  
 Doc Type SERIAL Bibliographic Level: ANALYTIC  
 Languages English  
 illus.. 1 table  
 Descriptors: rock mechanics; geologic hazards; land subsidence; failures; mining; underground space; finite element analysis; statistical methods; Young's modulus; elastic constants; Poisson's ratio  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1089339 82-13914

**The method of elasto-plastic analysis for underground excavations in consideration of the post-failure properties of rocks**

Mizuta, Y.; Ogino, S.; Lee, H.; Oka, Y.; Hiramatsu, Y.  
 Rock Mechanics in Japan 3, 105-107p., 1979  
 1 REFS.  
 Subfile B  
 Country of Publ.: Japan  
 Doc Type SERIAL Bibliographic Level: ANALYTIC  
 Languages English  
 illus.  
 Descriptors: rock mechanics; tunnels; excavations; methods; underground installations; rocks; plasticity; analysis; failures; behavior; stress; strain; uniaxial tests; finite element analysis; statistical methods; tensile strength  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1089346 82-13853

**Stability analysis of a submerged cut slope with consideration for stress-path dependence**

Kubayashi, Y.; Hashimoto, T.; Ichikawa, Y.  
 Rock Mechanics in Japan 3, 96-98p., 1979  
 1 REFS.  
 Subfile B  
 Country of Publ.: Japan  
 Doc Type SERIAL Bibliographic Level: ANALYTIC  
 Languages English  
 illus.. 1 table  
 Descriptors: soil mechanics; slope stability; site exploration; excavations; foundations; analysis; finite element analysis; statistical methods; soil profiles; granodiorite; granite-granodiorite family; triaxial tests; deformation; shear; failures; bridges  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1089342 82-13794

**A study of roadway closure**

Ihara, M.; Matsui, K.  
 Rock Mechanics in Japan 3, 83-85p., 1979  
 Subfile B  
 Country of Publ.: Japan  
 Doc Type SERIAL Bibliographic Level: ANALYTIC  
 Languages English  
 illus.. 1 table  
 Descriptors: rock mechanics; highways; applications; finite element analysis; stress; statistical methods; analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1089334 82-14137

**Physical and mechanical properties of soft rocks and its bearing capacity**

Yoshinaka, R.  
 Rock Mechanics in Japan 3, 53-55p., 1979  
 5 REFS.  
 Subfile B  
 Country of Publ.: Japan  
 Doc Type SERIAL Bibliographic Level: ANALYTIC  
 Languages English  
 illus.. 1 table  
 Descriptors: foundations; sedimentary rocks; materials; properties; clastic rocks; bearing capacity; mudstone; physical properties; mechanical properties; expansive materials; triaxial tests; rock mechanics; finite element analysis; statistical methods; materials; properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1089012 R2-12619

**Multiaxial testing to determine material behavior for design of energy related structures**

Sture, S.; Atkinson, R. H.; Ko, H. Y.  
Va Polytech. Inst. and State Univ., Blacksburg, VA, USA;  
Univ. Colo. Boulder, Boulder, CO, USA

**High-pressure science and technology; Vol. 2, Applications and mechanical properties**

Timmerhaus, K. D. (EDITOR); Barber, M. S. (EDITOR)  
Sixth AIRAPT International high pressure conference,  
Boulder, CO, United States, July 25-29, 1977  
Proceedings of the AIRAPT International High Pressure  
Conference 6, 272-284p., 1979  
ISBN 0-306-40069-3 21 REFS.

Country of Publ.: United States

Subfile: B  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Language: English

illus.: 1 table

Descriptors: geophysics; rock mechanics; experimental studies; materials; properties; high pressure; elastic properties; materials, properties; oil shale; Colorado; United States; plasticity; finite element analysis;  
Statistical methods 17 (GEOPHYSICS, GENERAL)

Section Headings: 17 (GEOPHYSICS, GENERAL)

108953R R2-13929

**Statistical investigation of the mechanics controlling radionuclide sorption; Part II**

Mucciaroli, A.; Rook, L. J.; Orr, E. C.; Cleveland, D.  
Adaptronics, McLean, VA, USA

**Proceedings of the Task 4, Waste Isolation Safety Assessment Program, Second contractor information meeting; Volume II**

Seine, R. J. (chairperson)  
Waste Isolation Safety Assessment Program, Second contractor information meeting, Seattle, WA, United States, Oct. 1-5, 1978

333 425p., 1978

3 REFS.

Subfile: B

Doc Type: REPORT; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Language: English

Report No.: PNL-SA-7352

Availability: Batelle Mem. Inst., Pacific Northwest Lab.,  
Richland, WA, United States

Note With discussion. Prepared for U. S. Dep. Energy,  
Off. Nucl. Waste Isol., illus.: tables  
Descriptors: geochemistry; technetium; strontium; cesium  
; neptunium; americium; plutonium; automatic data  
processing; waste disposal; isotopes; processes;

engineering geology; radioactive waste; abundance;  
adsorption; radioactive isotopes; silicates; shale;  
clastic rocks; granite; granite-granodiorite family;  
limestone; carbonate rocks; basalt; basalt family;  
mathematical models; models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1088114 R2-08760

Sandia Lab., USA

**Statistical data for movements on young faults of the conterminous United States; paleoseismic implications and regional earthquake forecasting**

Shaw, H. R.; Gartner, A. E.; Iusso, F.  
U. S. Geol. Surv., Menlo Park, CA, USA

Open-File Report (United States Geological Survey, 1978)

81-0946, 377p., 1981

CODEN: XGRDAG ISSN: 0196-1497 24 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; REPORT Bibliographic Level: MONOGRAPHIC

Language: English

Availability: U. S. Geol. Surv., Open-File Serv. Sect.,  
West. Distrib. Branch, Denver, CO, United States

illus.: 16 tables, sketch maps

Descriptors: United States; seismology; structural geology; earthquakes; engineering geology; neotectonics;

geologic hazards; prediction; USGS; conterminous regions;  
statistical analysis; faults; displacements; active faults;  
seismotectonics

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1087178 R2 DRG72

**Thermal and thermomechanical data from in situ heater experiments at Stripa, Sweden**

Chan, T.; Binnall, E.; Nielson, P.; Stolzman, R.; Wan, D.; Weaver, C.; Ang, K.; Bailey, J.; McEvoy, M.  
Lawrence Berkeley Lab., Berkeley, CA, USA  
LBL (Lawrence Berkeley Laboratory), Energy and Environment Division, 11477, 226p, 1980  
CODEN LPLI0H ISSN 0195-721X 15 REFS

Country of Publ: United States  
Doc Type: SERIAL; REPORT; Bibliographic Level: MONOGRAPHIC  
Languages: English  
Report No: SAC 29, UC 70  
Availability: MFIS, Springfield, VA, United States  
Swedish American Cooperative Program on Radioactive Waste Storage in Mined Cavities in Crystalline Rock, illus., 43 Tables

Descriptors: \*Sweden; \*automatic data processing; \*rock mechanics; \*engineering geology; materials; properties; waste disposal; granite; underground installations; radioactive waste; experimental studies; materials; properties; granite granodiorite family; thermal properties; stress; statistical analysis; computer programs; instruments; algorithms; data storage; Europe; Stripa  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1087167 92 19159

**The effect of pore structure on the mechanism of the water-drive of oil**

Yang Puhua  
Acta Pet Sin issue, 103 112p, 1980  
3 REFS

Country of Publ: China  
Doc Type: SERIAL; Bibliographic Level: ANALYTIC  
Languages: Chinese; Summary Languages: English  
In Commemoration of the Twentieth Anniversary of Daqing oil field, illus., 4 tables, 2 plates  
Descriptors: \*China; \*engineering geology; \*sedimentary rocks; petroleum engineering; properties; porosity; Asia; porous materials; reservoir rocks; pore water; pressure; petroleum; statistical analysis; Lamadian oil field; Saitu oil field; Xingshugang oil field; SIM data; flow mechanism; heterogeneous materials  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1087000 R2-09165

**Effects of erosion control structures along a portion of the northern Chesapeake Bay shoreline**

Zalawa, C. F.; Kurland, R. T.; Bayley, S.

M4 Dep: Nat. Resource, Coast. Zone Manage. Program.  
Annapolis, MD, USA, La. State Univ., USA  
Environ. Geol., 3, 4, 201-211p., 1981  
CODEN ENGEDC ISSN: 0099-0094 42 REFS.  
Subfile: B

Country of Publ.: International  
Doc Type: SERIAL; Bibliographic Level: ANALYTIC  
Languages: English  
illus.: 3 tables, sketch maps  
Latitude: N485300; N385300 Longitude: W0763000; W0763000  
Descriptors: \*Maryland; \*sedimentation; \*sediments; engineering geology; processes; textures; shorelines; coastal processes; grain size; Anne Arundel County; Chesapeake Bay; United States; Mayo Peninsula; Atlantic Coastal Plain; North America; erosion; controls; bulkheads; groins; transport; coastal environment; sorting; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1086998 82 08870

**Application of discriminant analysis and Manova to grain-size data on a study of the distribution and movement of dredged sediment**

Alther, G. R.; Wyeth, R. K.  
NAIRO Environ. Serv., Northbrook, IL, USA; Great Lakes Lab., USA

Environ. Geol., 3, 4, 185-193p., 1981  
CODEN ENGEDC ISSN: 0099-0094 25 REFS.

Country of Publ.: International  
Doc Type: SERIAL; Bibliographic Level: ANALYTIC  
Languages: English  
illus.: Sketch map

Latitude: N415746; N415746 Longitude: W0804744; W0804744  
Descriptors: iron; \*sediments; \*zinc; \*Ohio; \*automatic data processing; \*sedimentation; abundance; engineering geology; distribution; transport; waste disposal; statistical analysis; lacustrine processes; Ashtabula County; United States; Lake Erie; Great Lakes; Ashtabula; dredge spoils; solid waste; lacustrine environment; grain size; discriminant analysis; statistical methods; Manova; environmental geology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1086805 82-09213

**Distribution of landslides in the Wairarapa hill country**  
Crozier, M. J.; Eyles, R. J.; Marx, S. L.; McConchie, J. A.; Owen, R. C.  
Geophys. 73, 5-6, 575-586p, 1980  
CODEN NEZDAY ISSN 0028-8306 37 REFS  
Subfile: B  
Country of Publ.: New Zealand  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: 6 tables  
Latitude: 5410000; 5400000 longitude: E1760000; E1760000  
Descriptors: \*New Zealand; \*geomorphology; engineering geology; mass movements; slope stability; landslides; Australasia; Wairarapa; North Island; Masterton; statistical analysis; aerial photography; mudflows; Pakaraka; rainfall; distribution  
Section Headings: 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

1085177 82-09045

**The practice of mining geostatistics in 1980**  
Marchal, A.  
Ecole Natl. Super. Mines, Cent. Geostat., Fontainebleau, FRA  
Special issue on statistics in earth sciences  
Mardia, K. V. (EDITOR)  
Univ. Leeds, Dep. Stat., Leeds, GBR  
Communications in Statistics, Theory and Methods A10: 15, 1545-1558p., 1981  
CODEN CSTMPC ISSN 0361-0926 18 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*mining geology; \*automatic data processing; practice; engineering geology; statistical analysis; mines; assays; reserves; probability; linear regression; site exploration; digital simulation; anomalies; three-dimensional models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1084196 82-09148

**Dynamic FEM model of Oroville Dam**  
Wywood, J.  
Dep. Water Resour., Div. Saf. Dams, CA, USA  
Journal of the Geotechnical Engineering Division 107: G18, 1057-1075p., 1981  
CODEN AJGEB6 ISSN 0093-6405 17 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

1084088 82-08727

**Dynamic plastic analysis using stress resultant finite element formulation**  
Lukinaprasit, P.; Kelly, J. M.  
Report - Earthquake Engineering Research Center, College of Engineering, University of California, Berkeley, California 77/21, 46p., 1977  
ISSN: 0271-0323 44 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus.: 1 table  
Descriptors: \*automatic data processing; earthquakes; deformation; engineering geology; effects; theoretical studies; plasticity; finite element analysis; statistical methods; strain; nuclear facilities; seismic response; design; algorithms; loading; viscoelasticity; creep  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1084088 82-08727

**Dynamic plastic analysis using stress resultant finite element formulation**  
Lukinaprasit, P.; Kelly, J. M.  
Report - Earthquake Engineering Research Center, College of Engineering, University of California, Berkeley, California 77/21, 46p., 1977  
ISSN: 0271-0323 44 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus.: 1 table  
Descriptors: \*automatic data processing; earthquakes; deformation; engineering geology; effects; theoretical studies; plasticity; finite element analysis; statistical methods; strain; nuclear facilities; seismic response; design; algorithms; loading; viscoelasticity; creep  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1083841 82-08699

**A numerical field and laboratory study of flow in rocks with deformable fractures**

Gale, J. E.  
Environ. Can., Inland Waterways Div., Ottawa, ON, CAN  
Scientific Series - Inland Waters Directorate 72, 145p.,  
1977

CODEN CIMSAD ISSN 0318-5850 ISBN 0-662-01805-2 106  
REFS

Subfile B  
Country of Publ Canada  
Doc Type SERIAL Bibliographic Level MONOGRAPHIC  
Languages English Summary Languages French  
illus., 18 tables, sketch maps  
Descriptors Nova Scotia, rock mechanics; ground water;  
California; engineering geology; materials; properties;  
hydrogeology; surveys; aquifers; Canada; materials;  
properties; numerical models; flows; deformation;  
fractures; Sambro; Halifax County; fluid pressure;  
lineaments; well-logging; periscope logs; uniaxial tests;  
quartz monzonite; granite gneiss; injection;  
finite element analysis; statistical methods; permeability;  
United States; granites; Raymond; Cold Springs Quarry  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1083831 82-08942

**Seismic response of underground openings**

Emery, J. J.; Joshi, V. H.  
McMaster Univ., Dep. Civ. Eng., Hamilton, ON, CAN; The Trow  
Group, CAN

**Underground rock engineering: 13th Canadian rock mechanics symposium (the H. R. Rice memorial symposium)**

De Lory, F. A. (chairperson)  
Univ. Toronto, Toronto, ON, CAN  
Underground rock engineering: 13th Canadian rock mechanics  
Symposium (the H. R. Rice memorial symposium), Toronto, ON,  
Canada, May 28-29, 1980  
Special Volume - Canadian Institute of Mining and Metallurgy  
22, 177-186p., 1980  
CODEN CIMSAD ISSN 0576-5447 9 REFS.

Subfile B  
Country of Publ Canada  
Doc Type SERIAL CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages English  
illus., 1 table  
Descriptors tunnels; rock mechanics; waste disposal;  
methods; radioactive waste; seismic response; aseismic  
design; excavations; shafts; ground motion; surface waves;  
S-waves; coherent motion; finite element analysis;  
statistical methods  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1083823 82-08978

**Advancing face simulation of tunnel excavations and lining placement**

Hanafy, E. A.; Emry, J. J.  
Stone and Webster Can., Toronto, ON, CAN; McMaster Univ.,  
CAN

**Underground rock engineering: 13th Canadian rock mechanics symposium (the H. R. Rice memorial symposium)**

De Lory, F. A. (chairperson)  
Univ. Toronto, Toronto, ON, CAN  
Underground rock engineering: 13th Canadian rock mechanics  
Symposium (the H. R. Rice memorial symposium), Toronto, ON,  
Canada, May 28-29, 1980  
Special Volume - Canadian Institute of Mining and Metallurgy  
22, 119-125p., 1980  
CODEN CIMSAD ISSN 0576-5447 16 REFS.

Subfile B  
Country of Publ Canada  
Doc Type SERIAL CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages English  
illus., 3 tables, sects.  
Descriptors tunnels; rock mechanics; excavations;  
models; stress; finite element analysis; statistical  
methods; elastoplastic materials; linings; radial loading;  
axial loading; advancing faces  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1083809 82-09061

**A study of inclined hydraulic fracturing in brittle and impermeable rock**

Mizuta, Y.; Kobayashi, H.  
Univ. Minnesota, Minneapolis, MN, USA

**Underground rock engineering: 13th Canadian rock mechanics symposium (the H. R. Rice memorial symposium)**

De Lory, F. A. (chairperson)  
Univ. Toronto, Toronto, ON, CAN  
Underground rock engineering: 13th Canadian rock mechanics symposium (the H. R. Rice memorial symposium), Toronto, ON, Canada, May 28-29, 1980  
Special Volume - Canadian Institute of Mining and Metallurgy

22, 17-23p., 1980  
CODEN: CIMSAO ISSN: 0576-5447 10 REFS.

Subfile: B  
Country of Publ.: Canada  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
illus.: 1 table, block diag.  
Descriptors: rock mechanics; methods; stress; hydraulic fracturing; brittle materials; impermeable materials; granite; granite-granodiorite family; boreholes; biaxial tests; fractures; in situ; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1083469 82-08827

**Determination of spatial dependence in fracture set characteristics by geostatistical methods**

Miller, S. M.  
Univ. of Arizona, Tucson, AZ, USA

11p., 1979  
Subfile: B  
Degree Level: Master's  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Languages: English  
Descriptors: fractures; rock mechanics; distribution; deformation; spatial distribution; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1082771 82-03976

**Estimating mine pillar strength from compression tests**

Panek, L. A.  
U. S. Bur. of Mines, Denver Fed. Cent., Denver, CO, USA  
Transactions of the American Institute of Mining, Metallurgical, and Petroleum Engineers Incorporated 268, 1749-1761p., 1980

CODEN: TMENAE ISSN: 0096-4778 3R REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
Note: AIME annual meeting, New Orleans, La., Feb. 1979, illus., 1 table

Descriptors: rock mechanics; mining geology; underground installations; theoretical studies; methods; mines; strength; pillars; compression; mathematical models; models; statistical analysis; equations; multivariate analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1082062 82-04112

**Interpretation of the results of a rock mechanical test program for a powerhouse cavern by means of numerical analyses**

Wittke, W.; Pilschke, B.; Hosang, K. H.  
Huerlimann, H. (chairperson)  
4th international congress on rock mechanics, Montreaux, Switzerland, Sept. 2-8, 1979

Proceedings of the Congress of the International Society for Rock Mechanics 4, Vol. 3, 199-208p., 1979

CODEN: 32ZUA4 ISSN: 0074-848X ISBN: 90-6191-049-8 5 REFS.  
Subfile: B

Country of Publ.: Varies  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
illus.: 1 table, block diag.  
Descriptors: Taiwan; rock mechanics; engineering geology; excavations; tunnels; Asia; interpretation; finite element analysis; statistical methods; stress; strain; underground installations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1081155 82 03476

**Korrelation lithozoneller und bodenmechanischer Eigenschaf-  
ten von Sedimenten des Kuestenholozans der suedlichen Nordsee  
mit multivariaten statistischen Methoden**  
Correlation of lithofacies and soil mechanics properties of  
the Holocene coastal sediments of the southern North Sea with  
multivariate statistical methods

Ludwig, I  
Berl. Geowissenschaftliche Abh., Reihe A 31, 88p., 1980  
CODEN: RGAAAD ISSN: 0172-8784 107 REFS.

Subfile: B  
Country of Publ.: Germany, Federal Republic of  
Doc Type: SERIAL; MAP Bibliographic Level: MONOGRAPHIC  
Languages: German Summary Languages: English  
Note: Doctoral thesis, Freie Univ., Berlin.  
Tables, sects.: 8 plates; tops, index maps  
Latitude: N532000, N534000 Longitude: E0084500; E0070500  
Descriptors: \*West Germany; \*soil mechanics; \*engineering  
geology; materials; properties; stratigraphy; \*sediments;  
Holocene, Germany; Europe; Quaternary; lithofacies;  
classification; Ender; Wilhelmshaven; Bremerhaven; size  
distribution; ignition loss; porosity; moisture;  
consistency limits; bulk weight; activity; shear strength;  
angle of friction; undrained shear strength; compression  
modulus; multivariate analysis; statistical analysis;  
discriminant analysis; statistical methods; bogs; gullies;  
tidal flats; principal components analysis; materials;  
properties; cluster analysis; correlation; lith  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY.)

1080779 82 03990

**Slope stability analysis and design based on probability  
techniques at Cassiar Mine**

Pitman, D. R.; Martin, D. C  
D. P. Pitman and Assoc., West Vancouver, BC, CAN  
CIM Bulletin (1974) 70: 779, 139-150p., 1977  
ISSN: 0317-0926 5 REFS.

Subfile: A  
Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: 2 tables, sect.  
Latitude: N591000; N593000 Longitude: W1294000; W1300000  
Descriptors: \*rock mechanics; \*British Columbia; \*mining  
geology; materials; properties; engineering geology;  
methods; argillite; slope stability; open-pit mining;  
Cassiar Mine; Sylvester Group; Canada; northern British  
Columbia; design; failures; peridotite; ultramafic family;  
clastic rocks; volcanic rocks; fractures; joints; style;  
Strength; materials; properties; berms; wedges  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1080064 82-04014

**Comparative ground response studies in Los Angeles using MTS  
nuclear explosions and San Fernando earthquake data**

Rogers, A. M.; Covington, P. A.; Rorcherdt, R. D.; Tinsley,  
J. C., III  
U. S. Geol. Surv., Denver, CO, USA

**Proceedings of Conference XIII; Evaluation of regional  
seismic hazards and risk**

Hays, W. W. (EDITOR)  
Evaluation of regional seismic hazards and risk. Santa Fe,  
NM, United States, Aug. 25-27, 1980  
Open-File Report (United States Geological Survey, 1978)  
81-0437, 143-161p., 1981  
CODEN: XGRDAG ISSN: 0196-1497 5 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; REPORT; CONFERENCE PUBLICATION  
Bibliographic Level: ANALYTIC  
Languages: English  
Availability: U. S. Geol. Surv., Open-File Serv. Sect.,  
West Distrib. Branch, Denver, CO, United States  
illus.: 2 tables, sketch maps  
Latitude: N334500; N344500 Longitude: W1174000; W1185000  
Descriptors: \*California; \*seismology; \*Nevada;  
engineering geology; earthquakes; geologic hazards;  
explosions; ground motion; Los Angeles County; Nye County;  
USGS; seismic risk; United States; Southern California;  
San Fernando Valley; Nevada test site; nuclear explosions;  
Statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1080062 82-03938

**Seismic zoning in Canada; some modifications to current maps**

Miles, W. S.; Weichert, D. H.; Basham, P. W.; Berry, M. J.; Masagawa, H. S.  
 Pac. Geosci. Cent., Sidney, BC, CAN

**Proceedings of Conference XIII: Evaluation of regional seismic hazards and risk**

Hays, W. W. (EDITOR)  
 Evaluation of regional seismic hazards and risk. Santa Fe, NM, United States, Aug. 25-27, 1980  
 Open-File Report (United States Geological Survey, 1978)  
 81-0437, 138-1420, 1981  
 CODEN: XGROAG ISSN: 0196-1497 9 REFS.

Subfile B  
 Country of Publ.: United States  
 Doc. Type: SERIAL; REPORT; CONFERENCE PUBLICATION  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Availability: U. S. Geol. Surv., Open-File Serv. Sect., West Distrib. Branch, Denver, CO, United States  
 Note: Can.; Earth Phys. Branch; Contrib. No. 885.  
 Descriptors: \*Canada; \*seismology; engineering geology; earthquakes; geologic hazards; maps; seismic risk; USGS; seismicity; zoning; seismicity maps; probability; statistical analysis; cartography  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1080062 82-03634

**New probabilistic hazards maps for the United States; a progress report**

Altermusser, S. T.; Theriault, P. C.; Ashew, B.  
 U. S. Geol. Surv., Denver, CO, USA

**Proceedings of Conference XIII: Evaluation of regional seismic hazards and risk**

Hays, W. W. (EDITOR)  
 Evaluation of regional seismic hazards and risk. Santa Fe, NM, United States, Aug. 25-27, 1980  
 Open-File Report (United States Geological Survey, 1978)  
 81-0437, 137B, 1981  
 CODEN: XGROAG ISSN: 0196-1497

Subfile B  
 Country of Publ.: United States  
 Doc. Type: SERIAL; REPORT; CONFERENCE PUBLICATION  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Availability: U. S. Geol. Surv., Open-File Serv. Sect., West Distrib. Branch, Denver, CO, United States  
 Descriptors: \*United States; \*seismology; engineering geology; earthquakes; maps; geologic hazards; seismic risk; USGS; probability; geotechnical maps; seismicity maps  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1080054 82-03701

**Late Quaternary faulting as a guide to regional variations in long-term rates of seismic activity**

Bucknam, R. C.; Anderson, R. E.  
 U. S. Geol. Surv., Denver, CO, USA

**Proceedings of Conference XIII: Evaluation of regional seismic hazards and risk**

Hays, W. W. (EDITOR)  
 Evaluation of regional seismic hazards and risk. Santa Fe, NM, United States, Aug. 25-27, 1980  
 Open-File Report (United States Geological Survey, 1978)  
 81-0437, 27-29p., 1981  
 CODEN: XGROAG ISSN: 0196-1497

Subfile B  
 Country of Publ.: United States  
 Doc. Type: SERIAL; REPORT; CONFERENCE PUBLICATION  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Availability: U. S. Geol. Surv., Open-File Serv. Sect., West Distrib. Branch, Denver, CO, United States  
 Descriptors: \*Basin and Range Province; \*Great Basin; \*seismology; \*Western U.S.; \*faults; \*geomorphology; structural geology; earthquakes; engineering geology; displacements; landform evolution; neotectonics; geologic hazards; seismotectonics; active faults; fault scarps; USGS; seismic risk; United States; prediction; probability rates; seismicity  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1079278 82-03913

Raschetnyye seysmogrammy sil'nykh zemletraseniy diya sooruzheniya s uchetom chastotnykh osobennostey ochagovykh zon rayona  
 Estimation of the seismic forces of earthquakes for construction taking into account the frequency characteristics of the focal zone in the region  
 Plotnikova, L. M.; Ter-Karapetova, K. S.; Rustanovich, D. N.

Seysmicheskiye vozdeystviya na gidrotekhnicheskiye i energeticheskiye sooruzheniya  
 Seismic effect on hydrotechnical and power plant construction

Savaren'skiy, Y. F.  
 Publ. Izd. Nauka  
 132-144p. 1980  
 21 REFS.  
 Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc. Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: Russian  
 Descriptors: \*engineering geology; \*earthquakes; \*feasibility studies; \*prediction; \*site exploration; \*methods; \*statistical analysis; \*focus  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1079267 82-03913

Statisticheskiye svoystva privedennykh uskorenny sil'nykh zemletraseniy i prognoz seysmicheskikh usliy v slozhnykh sistemakh  
 The statistical behavior of corrected earthquake acceleration forces and the prediction of seismic stresses in complex systems

Lytkhin, V. M.; Frolova, N. I.

Seysmicheskiye vozdeystviya na gidrotekhnicheskiye i energeticheskiye sooruzheniya  
 Seismic effect on hydrotechnical and power plant construction

Savaren'skiy, Y. F.  
 Publ. Izd. Nauka  
 16-40p. 1980  
 37 REFS.  
 Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc. Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: Russian  
 Illustrations: 8 tables  
 Descriptors: \*earthquakes; \*engineering geology; \*effects; \*feasibility studies; \*acceleration; \*applications; \*prediction; \*statistical analysis; \*strong motion; \*spectral analysis; \*site exploration; \*ground motion  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1079265 82-03661

Statisticheskaya raschetnaya model' seysmicheskogo vozdeystviya na sooruzheniya  
 Statistical computational model of seismic effects on construction  
 Ayzenberg, Y. M.

Seysmicheskiye vozdeystviya na gidrotekhnicheskiye i energeticheskiye sooruzheniya  
 Seismic effect on hydrotechnical and power plant construction

Savaren'skiy, Y. F.  
 Publ. Izd. Nauka  
 5-11p. 1980  
 15 REFS.  
 Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc. Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: Russian  
 Descriptors: \*earthquakes; \*engineering geology; \*effects; \*feasibility studies; \*ground motion; \*applications; \*statistical analysis; \*mathematical models; \*models; \*site exploration  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1078924 82-03916

On the Tangshan earthquake and the earthquake risk areas

Ma Jin; Zhang Botao; Yuan Shurong  
 State Seismol. Bur., Beijing, CHN  
 26th International geological congress. Paris, France, July 7-17, 1980

Int. Geol. Congr. Abstr.---Congr. Geol. Int. Resumes 26, Vol. 3, 1230p., 1980  
 CODEN: IGABBY  
 Subfile: B

Country of Publ.: Varies  
 Doc. Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N390000; N400000 Longitude: E1183000; E1170000

Descriptors: \*China; \*seismology; \*earthquakes; \*engineering geology; \*geologic hazards; \*seismic risk; \*Asia; \*Tangshan; \*stress; \*mechanical properties; \*finite element analysis; \*statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1078946 R2 03742

**Etude statistique des resultats d'essais geotechniques realises en laboratoire sur l'argile des Flandres (Nord de la France)**  
**Statistical study of results of geotechnical tests made in the laboratory on Flanders Clay, northern France**  
Depraetere, D., Verreut, J. F.

**Materials and engineering geology**  
Walters, R. (EDITOR)  
26th international geological congress. Paris, France, July 7-17, 1980  
Int. Assoc. Eng. Geol., Bull. 22, 253-255p., 1980  
CODEN PIEGPG ISSN 0074-1612  
Subfile B  
Country of Publ.: International  
Doc. Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: French Summary Languages: English  
19 anal., 2 tables  
Descriptors: France; soil mechanics; soils; engineering geology; surveys; materials; properties; classification; clay; soils; Europe; Flanders Clay; experimental studies; tests; soil groups  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1077114 R2 03590

**Nonlinear soil-structure interaction analysis of one-, two-, and three-dimensional problems using finite element method**  
Srinivasan, H. J.  
Virginia Polytech. Inst. and State Univ., Blacksburg, VA, USA

35Rp., 1990  
Subfile B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc. Type: THESES Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: soil mechanics; automatic data processing; foundations; deformation; engineering geology; theoretical studies; stress; finite element analysis; statistical methods; structure; one dimensional models; models; two dimensional models; three dimensional models; mathematical models; algorithms; earth pressure  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1076842 R1 59410

**Depth estimation for ordinary high water of streams in the Mobile District of the U.S. Army Corps of Engineers, Alabama and adjacent states**

Harkins, J. R.; Green, M. E.  
U. S. Geol. Surv., USA  
(Open-file Report) (United States Geological Survey, 1978) 81-0481, 15p., 1981  
CODEN XGRDAG ISSN 0196-1497 3 REFS.

Subfile B  
Country of Publ.: United States  
Doc. Type: SERIAL; REPORT Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: U. S. Geol. Surv., Open-File Serv. Sect., West Distrib. Branch, Denver, CO, United States  
Sketch map  
Descriptors: Alabama; Gulf Coastal Plain; hydrology; engineering geology; surveys; waterways; USGS; United States; North America; rivers and streams; streamflow; high water; floods; statistical analysis; Mobile District  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1076293 R1-59666

**Statistical determination of design low flows**  
Prakash, A.  
Bechtel, San Francisco, CA, USA

**Water for survival**  
Beard, L. R. (EDITOR)  
Int. Water Resour. Assn., Publ. Comm., Austin, TX, USA  
International Water Resources Association, Third World Congress on water resources, Mexico City, Mexico, April 23-27, 1979  
J. Hydrol., 51 1-4, 109-118p., 1981  
CODEN JHYDA7 ISSN 0022-1694 6 REFS.

Subfile B  
Country of Publ.: International  
Doc. Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., 4 tables  
Descriptors: waterways; hydrology; rivers and streams; streamflow; statistical analysis; prediction; design; nuclear facilities; automatic data processing; engineering geology; hydraulics; probability; United States  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

AD-A136 355

COMPENDIUM OF ABSTRACTS ON STATISTICAL APPLICATIONS IN  
GEOTECHNICAL ENGIN..(U) ARMY ENGINEER WATERWAYS  
EXPERIMENT STATION VICKSBURG MS GEOTE..  
M E HYNES-GRIFFIN ET AL. SEP 83

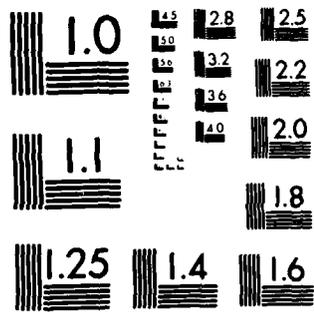
4/6

UNCLASSIFIED

F/G 13/2

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The microfiche grid consists of 14 columns and 10 rows of frames. All frames are blacked out, indicating that the content has been redacted. The grid is used for storing and retrieving small-scale documents or images.



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963 A

1016073 81-59956

Stato di tensione e di deformazione in un diaframma plastico e nel terreno interessato da uno scavo profondo in presenza di acqua  
State of stress and deformation in a plastic diaphragm of terrain disturbed by a deep excavation in the presence of water

Gatti, G.; Cividini, A.  
Geol. Tec. (Milan) 26: 4, 29-40p., 1979  
CODEN: GETEAX ISSN: 0435-3897 14 REFS.

Subfile: B  
Country of Publ.: Italy  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

illus., 1 table  
Descriptors: Italy; engineering geology; foundations; excavations; power plants; Tavazzano; finite element analysis; statistical methods; stress; strain; Europe  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1075579 81-59819

Probabilistic and hazard analysis for pore pressure increase in soils due to seismic loading

Chameau, J. A.  
Stanford Univ., Stanford, CA, USA  
24p., 1981

Subfile: B  
Degree level: Doctoral  
Country of Publ.: United States  
Doc Type: THESES Bibliographic Level: MONOGRAPHIC  
Languages: English

Availability: Univ. Microfilms  
Descriptors: geologic hazards; earthquakes; seismology; soil mechanics; effects; experimental studies; liquefaction; deformation; loading; pore pressure; cohesionless materials; probability; theoretical studies; seismic risk  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1074679 81-60045

Badanie reżimu energetycznego w wybranym rejonie kopalni "Lubin" w latach 1973-1974  
Energy release in selected regions of the "Lubin" copper mine in 1973 and 1974

Kowalska, R.  
Wybrane zagadnienia geofizycznych badan w kopalniach  
Some geophysical problems in mines  
Wornik, M. (EDITOR); Teisseyre, R. (EDITOR); Malkowski, Z. (EDITOR); Sionka, J. (EDITOR); Jankowski, J. (EDITOR)  
Wybrane zagadnienia geofizycznych badan w kopalniach.

Mogilany, Poland, Oct. 17-19, 1977  
Pol. Acad. Sci., Inst. Geophys., Publ., Ser. M, Misc. 3, 177-182p., 1980  
ISBN: 83-01-01927-1 1 REFS.

Subfile: B  
Country of Publ.: Poland  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: Polish Summary Languages: English

illus.  
Latitude: N490000; N544500 Longitude: E0241500; E0141500  
Descriptors: Poland; mining geology; engineering geology; technology; earthquakes; statistical analysis; Lubin Mine; Europe; aftershocks; stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1074665 81-60096

Application of the Wang computer for the solution of some problems of expansion tencometry  
Muzik, L.; Skorpova, J.

Wybrane zagadnienia geofizycznych badan w kopalniach  
Some geophysical problems in mines

Wornik, M. (EDITOR); Teisseyre, R. (EDITOR); Malkowski, Z. (EDITOR); Sionka, J. (EDITOR); Jankowski, J. (EDITOR)  
Wybrane zagadnienia geofizycznych badan w kopalniach, Mogilany, Poland, Oct. 17-19, 1977

Pol. Acad. Sci., Inst. Geophys., Publ., Ser. M, Misc. 3, 3-12p., 1980  
ISBN: 83-01-01927-1  
Subfile: B  
Country of Publ.: Poland

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: Polish

illus.  
Descriptors: automatic data processing; mining geology; rock mechanics; engineering geology; materials; properties; methods; stress; tencometry; statistical analysis; materials; properties; strain  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1074580 81-57649

Finite element analysis of thermal convection in deep ocean sediments

Gartling, D. K.  
U. S. Dep. Energy, Sandia Lab., Heat Transfer and Fluid Mech. Div., USA  
Wang, S. Y. (EDITOR); Alonso, C. V. (EDITOR); Brebbia, C. A. (EDITOR); Gray, W. G. (EDITOR); Pinder, G. F. (EDITOR)  
Third International Conference on finite elements in water resources, University, MS, United States, May 1980  
Int. Conf. Finite Elem. Water Resour., Proc. 3, 7.30-7.44 p., 1980

17 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: sediments; waste disposal; heat flow; ocean floors; properties; radioactive waste; distribution; anomalies; engineering properties; deep-sea environment; convection; thermal convection; crust; environmental analysis; finite element analysis; statistical methods; porous materials; basalt; basalt family; heat sources; MARIAN; automatic data processing; engineering geology  
Section Headings: 07 (MARINE GEOLOGY AND OCEANOGRAPHY)

1074577 81-60050

A data management system for finite element sediment transport models

LaGarde, V. E.; Heltzel, S. R.  
U. S. Army Corps Eng., Waterw. Exp. Stn., USA  
Wang, S. Y. (EDITOR); Alonso, C. V. (EDITOR); Brebbia, C. A. (EDITOR); Gray, W. G. (EDITOR); Pinder, G. F. (EDITOR)  
Third International Conference on finite elements in water resources, University, MS, United States, May 1980  
Int. Conf. Finite Elem. Water Resour., Proc. 3, 6.35-6.46 p., 1980

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., 1 table, sketch maps  
Descriptors: waterways; automatic data processing; hydrology; hydraulics; rivers and streams; engineering geology; sediment yield; transport; data handling; finite element analysis; statistical methods; Washington; United States; Louisiana; Columbia River; Atchafalaya Bay; sediments; grain size; graphic display; algorithms  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1074575 81-59615

Two-dimensional finite element analysis of the hydraulic effect of highway bridge fills in a complex flood plain

Lee, J. K.  
U. S. Geol. Surv., USA  
Wang, S. Y. (EDITOR); Alonso, C. V. (EDITOR); Brebbia, C. A. (EDITOR); Gray, W. G. (EDITOR); Pinder, G. F. (EDITOR)  
Third International Conference on finite elements in water resources, University, MS, United States, May 1980  
Int. Conf. Finite Elem. Water Resour., Proc. 3, 6.3-6.23 p., 1980

9 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., 1 table, sketch maps  
Latitude: N334500; N340500 Longitude: W0810000; W0811500  
Descriptors: South Carolina; hydrology; engineering geology; surveys; Foundations; Lexington County; United States; bridges; hydraulics; finite element analysis; statistical methods; Congaree River; rivers and streams; two-dimensional models; models; channel geometry; roughness; floods; dikes; intrusions  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1074341 81-59995

Mathematisch-statistische Zusammenhänge zwischen gesteinsmechanischen und gesteinsphysikalischen Kennwerten

Mathematisch-statistical relations between rock mechanic and petrophysical parameters  
Hayne, K. H.  
Z. Angew. Geol. 26: 10, 519-523p., 1980  
CODEN: ZANGAK ISSN: 0044-2259 5 REFS.  
Subfile: B  
Country of Publ.: German Democratic Republic  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: German Summary Languages: Russian  
illus.

Descriptors: rock mechanics; materials; properties; statistical analysis; materials; properties; factor analysis; statistical methods; regression; anhydrite; sulfates; heat flow; density; tensile strength; compressive strength  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1074012 81-59889

Automaticke zpracovani casove posloupnosti seismokustickych impulsu  
Automatic processing of the time sequence of seismoacoustic impulses  
Broz, M.; Fucik, P.

Wybrane zagadnienia geofizycznych badan w kopalniach

Some geophysical problems in mines

Teisseyre, R. (EDITOR)

Wybrane zagadnienia geofizycznych badan w kopalniach,

Krosienko, Poland, Oct. 21-24, 1974

Pol. Acad. Sci., Inst. Geophys., Publ., Ser. M, Misc. M-1

(97), 179-189p., 1976

5 REFS.

Subfile: B

Country of Publ.: Poland

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: Polish Summary Languages: English

illus., charts

Descriptors: rock mechanics; automatic data processing;

geophysical methods; methods; geophysical surveys;

acoustical methods; seismoacoustic methods; applications;

mathematical models; models; computer programs;

Czechoslovakia; Europe; Brezove hory Mountains; Pribram;

Bohemia; statistical analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1074000 81-60153

Predice kladenskych dulinich otresu pomoci dvoukanalove  
wienerovske prediktivni filtrace  
Prediction of rock bursts in Kladno Colliery by means of the  
two-channel Wiener predictive filtration  
Rudajev, V.; Pec, K.; Bubek, J.

Wybrane zagadnienia geofizycznych badan w kopalniach

Some geophysical problems in mines

Teisseyre, R. (EDITOR)

Wybrane zagadnienia geofizycznych badan w kopalniach,

Krosienko, Poland, Oct. 21-24, 1974

Pol. Acad. Sci., Inst. Geophys., Publ., Ser. M, Misc. M-1

(97), 15-27p., 1976

5 REFS.

Subfile: B

Country of Publ.: Poland

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: Polish Summary Languages: English

illus., tables, charts

Latitude: N500500 Longitude: E0141000; E0140000

Descriptors: Czechoslovakia; automatic data processing;

engineering geology; geologic hazards; Europe; coal;

organic residues; mines; Kladno; rock bursts; statistical

analysis; prediction; methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1072161 81-60085

Statistical uncertainties in seismic hazard evaluations in  
the United States

McGuire, R. K.; Shedlock, K. M.

U. S. Geol. Surv., Denver, CO, USA

Bulletin of the Seismological Society of America 71: 4,

1285-1309p., 1981

CODEN: BSSAAP ISSN: 0037-1106 23 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus., 3 tables

Descriptors: United States; seismology; engineering

geology; earthquakes; geologic hazards; seismic risk;

statistical analysis; mathematical models;

probability; automatic data processing; ground motion

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1070864 81-54426  
**Kontsentratsionnyy kriteriy ob'yemogo razrusheniya**  
**vydykh tel**  
**Concentrated criteria for the destruction of solid bodies**  
 Zhurkov, S. N.; Kuksenko, V. S.; Petrov, V. A.; Savel'yev, V. N.; Sultanov, U. S.  
**Fizicheskiye protsessy v ochagakh zemletreseniya**  
**Physical processes in earthquake foci**  
 Sadovskiy, M. A. (EDITOR); Myachkin, V. I. (EDITOR)  
 Vsesoyuznaya nauchnaya sessiya. Fizicheskiye protsessy v ochagakh zemletreseniya. Moscow, Union of Soviet Socialist Republics, May 16-19, 1977  
 Publ: Izd. Nauka  
 78-86p., 1980  
 8 REFS.  
 Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: Russian  
 Descriptors: earthquakes; rock mechanics; seismology ; effects; materials; properties ; crust; strain; statistical analysis; velocity; materials, properties; focal mechanism  
 Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

Int. Geol. Congr. Abstr.--Congr. Geol. Int., Resumes 26, Vol. 2, 89p., 1980  
 CODEN: IGABBY  
 Subfile: B  
 Country of Publ.: Varies  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: engineering geology; automatic data processing; petroleum engineering; reservoir properties; reservoir rocks; fractures; mathematical models; porosity; permeability; statistical analysis; optimization  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1070309 81-55267  
**Radioactive waste disposal into Boom Clay Formation; probabilistic assessment of the geological containment**  
 D'Alessandro, M.; Bonne, A.  
 JRC, Ispra, IITA: CEN/SCK, BEL  
 26th International geological congress, Paris, France, July 7-17, 1980  
 Int. Geol. Congr. Abstr.--Congr. Geol. Int., Resumes 26, Vol. 2, 85p., 1980  
 CODEN: IGABBY  
 Subfile: B  
 Country of Publ.: Varies  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N51000; N511500 Longitude: E0051000; E0050500  
 Descriptors: Belgium; engineering geology; waste disposal; Europe; Boom Clay Formation; Boom's Clay; Mol; radioactive waste; storage; failures; probability; geologic hazards; automatic data processing; ground water; faults  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1070455 81-55930  
**Soil mass and volume relationship for a Vertisol**  
 Gupta, U. S.; Gupta, R. K.  
 Indian Soc. Soil Sci., J. 28, 4, 507-509p., 1980  
 CODEN: JINSA4 ISSN: 0019-638X 5 REFS.  
 Subfile: B  
 Country of Publ.: India  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., 4 illus., 2 tables  
 Descriptors: India; soils; soil mechanics; materials; properties; surveys; Vertisols; volume; Asia; expansion; physical properties; mass; desiccation; properties; statistical analysis  
 Section Headings: 25 (SURFICIAL GEOLOGY, SOILS)

1070388 81-55499  
**Identification of naturally fractured reservoirs by optimal control methods**  
 Winter, A.  
 Geol. Surv. Dev., Copenhagen, DNK  
 26th International geological congress, Paris, France, July 7-17, 1980

Int. Geol. Congr. Abstr.--Congr. Geol. Int., Resumes 26, Vol. 2, 89p., 1980  
 CODEN: IGABBY  
 Subfile: B  
 Country of Publ.: Varies  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N51000; N511500 Longitude: E0051000; E0050500  
 Descriptors: Belgium; engineering geology; waste disposal; Europe; Boom Clay Formation; Boom's Clay; Mol; radioactive waste; storage; failures; probability; geologic hazards; automatic data processing; ground water; faults  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1070175 81-55433

Vliyanie sostava i granulometrii kollektorov na ikh poristost i pronsytayemost  
The influence of the composition and granulometry of reservoir rocks on their porosity and permeability  
Pritulko, G. I.; Petkevich, G. I.; Pilyanskaya, N. D.  
Geol. Geokhim. Goryuch. Iskop. (Akad. Nauk Ukr. SSR) 55, 40-43p., 1980  
CODEN: GGGIAS ISSN: 0135-2164 3 REFS.  
Subfile: B

Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Russian  
3 tables

Descriptors: \*engineering geology; \*sedimentary rocks; petroleum engineering; textures; reservoir rocks; granulometry; properties; porosity; permeability; statistical analysis; composition  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1069645 81-55095

Extended figures and tables for the inter-comparison of faults, roof failure and mining rate in a New South Wales colliery

Shepherd, J.; Fisher, N. I.  
Investigation Report - CSIRO Institute of Earth Resources  
125, 16p., 1978  
CODEN: ICIKRS ISSN: 0156-9953 6 REFS.

Subfile: B  
Country of Publ.: Australia  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English

illus., tables, sketch map  
Latitude: 5373000; 5281500 Longitude: E1533000; E1410000  
Descriptors: \*New South Wales; \*mining geology; \*economic geology; \*technology; \*engineering geology; \*coal; \*roof control; \*underground installations; Australia; \*organic residues; \*statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1069457 81-54350

Three-dimensional finite element analysis of relationship between stress state of a rock mass and driving force

Ion Ivanov; Gao Weilan; Wang Qiming  
Seismology and Geology 2: 1, 3-10p., 1980  
Subfile: B

Country of Publ.: China  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Chinese Summary Languages: English  
illus., 1 table, block diag.  
Descriptors: \*seismology; \*rock mechanics; \*theoretical

Studies: three-dimensional models; models; finite element analysis; statistical methods; earthquakes; stress; faults; genesis  
Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

1069456 81-55504

Statistical analysis of factors causing liquefaction of sand during the Tangshan Earthquake

Zhu Shulian  
Seismology and Geology 2: 2, 79-80p., 1980  
Subfile: B

Country of Publ.: China  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., 1 table

Latitude: M400000; M400000 Longitude: E1240000; E1240000  
Descriptors: \*China; \*soil mechanics; \*engineering geology; materials; properties; earthquakes; liquefaction; Asia; statistical analysis; materials; properties; Tangshan earthquake  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1068286 81-55442

Analysis of slope stability at Gonyella Mine

Richards, B. G.; Coulthard, M. A.; Toh, C. T.  
CSIRO, Div. Appl. Mech., Mount Waverley, AUS  
Canadian Geotechnical Journal--Revue Canadienne de Geotechnique 18: 2, 179-194p., 1981  
CODEN: CGJNAH ISSN: 0008-3674 15 REFS.

Subfile: B  
Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus., 1 table, sects.  
Latitude: S210000; S210000 Longitude: E1480000; E1480000

Descriptors: \*Australia; \*mining geology; \*soil mechanics; \*engineering geology; \*production control; case studies; slope stability; strip mining; Gonyella Mine; Queensland; coal; organic residues; Permian; Paleozoic; sandstone; clastic rocks; siltstone; claystone; aquifers; ground water; levels; mine dumps; shear strength; blasting; finite element analysis; statistical methods; displacements; moisture  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

106R038 81-55321

**Statistical study of uniform cycles in earthquakes**

Haidar, A.; Tang, W. H.  
 Ge. Inst. Technol. Sch. Civ. Eng., Atlanta, GA, USA; Univ.  
 Ill., Dep. Civ. Eng., USA  
 Journal of the Geotechnical Engineering Division 107: G15,  
 577-589p., 1981  
 CODEN: AJGEB6 ISSN: 0093-6405 33 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: 2 tables

Descriptors: soil mechanics; earthquakes; experimental  
 studies; effects; stress; soils; in situ; Alaska;  
 United States; Anchorage earthquake; Japan; Asia; Niigata  
 earthquake  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

106794R 81-56773

**Actual percentage recovery at the Raccoon coal mine, Kanawha  
 County, West Virginia**

McClelland, S. W.  
 W. Va. Geol. Econ. Surv., Morgantown, WV, USA  
 Proceedings of the West Virginia Academy of Science 1981  
 Furthitt, H. W. (EDITOR); Keller, E. C., Jr. (EDITOR)  
 Fifty-sixth annual session of the West Virginia Academy of  
 Sciences, Morgantown, WV, United States.  
 Proceedings of the West Virginia Academy of Science 53: 1,  
 17p., 1981  
 CODEN: PWAAI ISSN: 0096-4263  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English

Latitude: N380000 Longitude: W0810000; W0810000  
 Descriptors: West Virginia; economic geology;  
 engineering geology; coal; mining geology; Kanawha County;  
 United States; organic residues; practice; recovery;  
 Raccoon Mine; statistical data; percent recovery;  
 Appalachian Plateau  
 Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

1067763 81-55327

**Statistical analysis of marine clay deposits**

Hin Fatt Cheong; Subrahmanyam, R. V.  
 Journal of the Geotechnical Engineering Division 107: G12,  
 221-228p., 1981  
 CODEN: AJGEB6 ISSN: 0093-6405 4 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 chart, 4 tables

Descriptors: Singapore; soils; soil mechanics; site  
 exploration; surveys; analysis; clay; marine environment;  
 clastic sediments; marine sediments; Asia; coasts  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1067748 81-55474

**Probabilistic evaluation of loads**

Tang, W. H.  
 Univ. Ill., Dep. Civ. Eng., Urbana, IL, USA  
 Journal of the Geotechnical Engineering Division 107: G73,  
 287-304p., 1981  
 CODEN: AJGEB6 ISSN: 0093-6405 36 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: 1 table

Descriptors: soil mechanics; earthquakes; theoretical  
 studies; effects; loading; load casts; turbidity current  
 structures; sedimentary structures; probability; wind  
 transport; slope stability; seismic risk; liquefaction;  
 pore pressure; seepage; histograms; Richter scale  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1067303 81-55468

**Spatial variability of flow parameters in a stratified sand**  
Smith, L.  
Univ. Utah, Dep. Geol. and Geophys., Salt Lake City, UT, USA  
Journal of the International Association for Mathematical  
Geology 13: 1, 1-21p., 1981  
CODEN: IMAJBS ISSN: 0020-5988 17 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Illustr.: 3 tables, sketch map  
Latitude: N49°50'; W123°00' Longitude: W123°00'; W123°00'  
Descriptors: \*British Columbia; \*soil mechanics;  
\*mathematical geology; \*engineering geology; materials;  
properties; methods; \*mathematical models; Canada;  
sediments; clastic sediments; sand; porosity; grain size;  
materials, properties; hydraulic conductivity; compressibi-  
lity; Quaternary sand; distribution; statistical analysis;  
models; power-spectrum analysis; Vancouver; stochastic  
processes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1066534 81-50084

**Probability of earthquake occurrence in the vicinity of the**  
**Chena flood control dam near Fairbanks, Alaska**  
Davis, T. N.; Estes, S. A.; Gedney, L. R.  
UACR (Geophysical Institute, University of Alaska) R-262  
Seismological Report No. 7, 18p., 1978  
CODEN: AUGGAK ISSN: 0271-4892 9 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
Note: Final report, illus., 7 tables, sketch maps  
Latitude: N64°45'; W147°00' Longitude: W147°00'; W147°45'  
Descriptors: \*Alaska; \*seismology; engineering geology;  
earthquakes; prediction; United States; Fairbanks;  
occurrence; magnitude; tectonics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1066016 81-52075

**Statistical analysis of density and porosity of subsurface**  
**rock samples from Cauvery Basin**

Koithara, J.; Bisht, J. S.; Raj, H.  
Workshop on coastal sedimentaries of India  
Madras, India.  
March 28-30, 1976  
Publ.: Oil and Nat. Gas Comm.  
27p., 1976

Subfile: B  
Country of Publ.: India  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

IGCP Project No. 032,  
Latitude: N09°00'; E120°00' Longitude: E08°00'; E07°40'00'  
Descriptors: \*India; \*rock mechanics; economic geology;  
materials; properties; petroleum; reservoir rocks; Asia;  
basins; sedimentary basins; coastal environment; Cauvery  
Basin; Tamil Nadu; statistical analysis; density; porosity  
; reservoir properties; exploration; materials, properties  
; Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

1065769 81-50288

**Primeneniye metoda konechnykh elementov pri seysmalicheskom**  
**mikroyanirovani**  
**Applying finite element methods during seismic microzoning**  
Gogeliya, T. I.; Napetvaridze, S. G.

**Seysmicheskoye mikroyanirovaniye**  
**Seismic microzoning**

Medvedev, S. V. (EDITOR)  
Publ.: Izd. Nauka  
161-164p., 1977  
Subfile: B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: Russian  
Illustr.:  
Descriptors: \*automatic data processing; \*earthquakes;  
engineering geology; effects; seismic risk; finite element  
analysis; statistical methods; mathematical methods; zoning  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

DIALOG File#9: GEOPREF - 81-82/Sep (Copr. American Geological Institute) (Item 220 of 1356) User 5208 2sep82

1065767 81-50396  
 Issledniye dannyye dlya prikladnoy raschetnykh sposobov v  
 seysmicheskoy mikroyazovirovani)  
 Preliminary data for measuring estimated capacity in seismic  
 microzoning  
 Napetvaridze, S. G.; Ddshariya, A. V.

Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: Russian  
 illus.: 2 tables  
 Descriptors: \*earthquakes; \*soil mechanics; \*effects;  
 materials; properties; seismic risk; strain; zoning;  
 statistical analysis; materials, properties; instruments  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1063629 81-50129  
 Probabilistic estimates of maximum seismic horizontal ground  
 motion on rock in coastal California and the adjacent outer  
 continental shelf  
 Tienhaus, P. C.; Perkins, D. M.; Ziony, J. I.; Algermissen,  
 S. T.  
 Open-File Report (United States Geological Survey, 1978)  
 80-0924, 69p., 1980  
 CODEN: XGRDAG ISSN: 0196-1497 55 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; REPORT; MAP Bibliographic Level:  
 MINOGRAPHIC  
 Languages: English  
 Availability: U. S. Geol. Surv., Open-File Serv. Sect.,  
 West. Distrib. Branch, Denver, CO, United States  
 illus.: maps  
 Latitude: N303000 Longitude: W1140000; W1260000  
 Descriptors: \*California; \*seismology; \*Pacific Ocean  
 earthquakes; engineering geology; oceanography; geologic  
 hazards; continental shelf; ground motion; USGS; United  
 States; North American Pacific; prediction; probability;  
 outer shelf  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1063211 81-49090  
 Statistical characteristics of elastic wave velocities in  
 crystalline rocks under high pressures  
 Volkovits, I. N.; Volarovich, M. I.; Bayuk, K. I.

USSR Acad. Sci., D. Yu. Shmidt Inst. Earth Phys., SUN  
 Physics of the Solid Earth 15: 5, 364-369p., 1979  
 CODEN: IPSEBO ISSN: 0001-4354 26 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: tables  
 Descriptors: \*seismology; \*metamorphic rocks; \*igneous rocks  
 ; \*rock mechanics; \*geophysics; \*mantle; \*crust; \*elastic  
 waves; properties; materials; experimental studies;  
 p-waves; elastic properties; velocity; statistical analysis  
 ; crystalline rocks; p-t conditions; high pressure; upper  
 mantle; elasticity; materials, properties  
 Section Headings: 17 (GEOPHYSICS, GENERAL)

1062922 81-50330  
 Comparison of zero-stress contours to surface erosion for  
 excavated slopes in stratified rock  
 Kalkanli, E. C.  
 Stanford Univ., Dep. Geophys., Stanford, CA, USA  
 Eng. Geol. 17: 1-2, 55-60p., 1981  
 CODEN: EGGQAO ISSN: 0013-7952 2 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*slope stability; \*deformation; \*rock mechanics  
 ; erosion; theoretical studies; excavations; prediction;  
 stress; two-dimensional models; models; finite element  
 analysis; statistical methods; stratification; planar  
 bedding structures; sedimentary structures; siltstone;  
 elastic rocks; sandstone; tension; geologic hazards  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1063211 81-49090  
 Statistical characteristics of elastic wave velocities in  
 crystalline rocks under high pressures  
 Volkovits, I. N.; Volarovich, M. I.; Bayuk, K. I.

1062747 81-49092

**Systematics of crack controlled mechanical properties for a suite of Conway granites from the White Mountains, New Hampshire**

Warren, N.; Tiernan, M.  
Univ. Calif., Inst. Geophys. and Planet. Phys., Los Angeles, CA, USA

Tectonophysics 73: 4, 295-322p., 1981  
CODEN: TCTOAM ISSN: 0040-1951 13 REFS.

Subfile: B

Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Note: Univ. Calif., Inst. Geophys. and Planet. Phys.  
Contrib. No. 2000. illus., tables  
Latitude: N435000; N441000 Longitude: W0710500; W0711500  
Descriptors: New Hampshire; deformation; fractures; rock mechanics; igneous rocks; structural geology; experimental studies; materials; properties; granites; mechanical properties; cracks; Carroll County; Conway Formation; Gascapla Formation; White Mountain Plutonic Series; United States; White Mountains; Conway; cores; dikes; intrusions; metamorphites; ultramylonite; physical properties; microfracks; materials; properties; strain; acoustical properties; pressure; textures; cluster analysis; statistical methods  
Section Headings: 17 (GEOPHYSICS, GENERAL)

1062447 81-51075

**Ontario mining statistics; a preliminary compendium**

Pye, C. H. (COMPILER); Hinton, M. N. A. (COMPILER); McMurray, C. E. (COMPILER)  
Min. Resour. Branch, Ont. Minist. of Nat. Resour., Toronto, ON, CAN

Mineral Policy Background Paper 11, variously paginated p., 1979

ISSN: 0765-103X

Subfile: B

Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
tables

Latitude: N420000; N570000 Longitude: W0740000; W0950000  
Descriptors: Ontario; economic geology; environmental geology; engineering geology; mineral resources; pollution; waste disposal; Canada; data; mining geology; metal ores; production; history; legislation; practice; taxes; impact statement  
Section Headings: 26 (ECONOMIC GEOLOGY, GENERAL & MINING)

1062335 81-50426

**Seismic vulnerability of a water distribution system; a case study**

Pikul, R. R.; Wang, L. R.; O'Rourke, M. J.  
Clough Assoc., Albany, NY, USA; Rensselaer Polytech. Inst., USA

Third Canadian conference on earthquake engineering, Montreal, PQ, Canada, June 4-6, 1979

Proceedings - Canadian Conference [on] Earthquake Engineering-Compte Rendus - Conference Canadienne [du] Genie Sismique 3, 1365-1389p., 1979  
8 REFS.

Subfile: B

Country of Publ.: Canada  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus., tables, geol. sketch maps  
Latitude: N424000; N424000 Longitude: W0734000; W0734000  
Descriptors: New York; soil mechanics; engineering geology; seismology; case studies; earthquakes; seismicity; seismic response; Albany County; United States; field studies; effects; seismic effects; Latham water district; probability; pipelines; seismic risk; unconsolidated materials; buried valleys; shear; contour maps; maps  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1062330 81-50216

**Criteria d'analyse sismique des grands barrages**

**Seismic analysis criteria for large dams**

Bureau, G. J.

Int. Eng. Co., San Francisco, CA, USA  
Third Canadian conference on earthquake engineering, Montreal, PQ, Canada, June 4-6, 1979

Proceedings - Canadian Conference [on] Earthquake Engineering-Compte Rendus - Conference Canadienne [du] Genie Sismique 3, 147-176p., 1979  
49 REFS.

Subfile: B

Country of Publ.: Canada  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: French Summary Languages: English  
illus., tables

Latitude: N360000; N360000 Longitude: W1180000; W1180000  
Descriptors: dams; foundations; earthquakes; design; effects; seismic risk; California; United States; Owens Valley Fault; nuclear facilities; engineering geology; finite element analysis; statistical methods; Sierra Nevada  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1062197 81-50406

**Analisis de losas de fundacion a traves del metodo de elementos finitos**  
**Mat foundation analysis by finite element method**

Obitnovic, H.; Ortigosa, P.  
 Sexto congreso Panamericano de mecanica de suelos e Ingenieria de cimentaciones, Lima, Peru, December 2-7, 1979

Congreso Panamericano de Mecanica de Suelos e Ingenieria de Fundaciones-Panamerican Conference on Soil Mechanics and Foundation Engineering 6, Vol. III, 275-282p., 1979  
 14 REFS.

Subfile: B  
 Country of Publ.: Argentina  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: Spanish Summary Languages: English

Descriptors: \*soil mechanics; \*foundations; theoretical studies; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1062182 81-50461

**Analysis of vibratory behavior of machine foundations and finite element analysis for vibrations of surrounding ground**

Sans, C. E.; Browning, W. V.  
 Lav Eng. Test., Charlotte, NC, USA  
 Sexto congreso Panamericano de mecanica de suelos e Ingenieria de cimentaciones, Lima, Peru, December 2-7, 1979

Congreso Panamericano de Mecanica de Suelos e Ingenieria de Fundaciones-Panamerican Conference on Soil Mechanics and Foundation Engineering 6, Vol. III, 81-92p., 1979  
 7 REFS.

Subfile: B  
 Country of Publ.: Argentina  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English Summary Languages: Spanish

Descriptors: \*foundations; \*soil mechanics; experimental studies; vibration; shear modulus; finite element analysis; statistical methods; elastic constants  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1061853 81-50272

**Reactions between aggregates and cement paste: an interpretation of the pessimum**  
 French, W. J.

Applied petrology: the stability of concrete aggregates

Robertson, A. D. (chairperson)  
 Ordinary general meeting of the Geological Society: Applied petrology: the stability of concrete aggregates. London, United Kingdom, Feb. 1979

Q. J. Eng. Geol. 13: 4, 231-247p., 1980  
 CODEN: QJEGA7 ISSN: 0481-2085 42 REFS.

Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
 Illustrations: 1 anal., 1 table  
 Descriptors: \*engineering geology; \*construction materials; materials; properties; concrete; cement materials; reactions; statistical analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1059944 81-44898

**Discrimination of landslide slopes and estimation of hazard based on morphological analysis**

Yoshimatsu, H.; Shimizu, K.; Sakamoto, Y.  
 Landslide - Journal of the Japan Society of Landslide 15: 4, 3(56), 12-19p., 1979  
 7 REFS.

Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English

Illustrations: 4 tables  
 Descriptors: \*geologic hazards; \*slope stability; landslides; possibilities; classification; engineering geology; methods; statistical analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)



105774 81-44817

**Remarks on the validity of stability analyses; discussion and reply**

Robert, J. M.; Tavenas, F.; Trak, B.; Lerouell, S.  
 Que. Minist. Energy Resour., Geotech. Serv., Quebec, PQ, CAN  
 Canadian Geotechnical Journal--Revue Canadienne de  
 Geotechnique 18: 1, 146-151p., 1981  
 CODEN: CGJDAH ISSN: 0008-3674 21 REFS.  
 Subfile: B

Country of Publ.: Canada  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: French

Note: For original paper by Tavenas, F., Trak, B., and  
 Lerouell, S., see Can. Geotech. J., Vol. 17, pgs. 61-73, 1980;  
 discussion in french, reply in English, illus.  
 Descriptors: \*soil mechanics; \*Quebec; methods;  
 engineering geology; stability; Champlain Clays; models;  
 rupture; erosion; finite element analysis; statistical  
 methods; slope stability; Canada  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

105774 81-44822

**A comparative seismic hazard study for Azerbaïjan Province in Iran**

Rowshandel, B.; Nemat-Nasser, S.; Corotis, R. B.  
 Northwest. Univ., Dep. Civ. Eng., Evanston, IL, USA  
 Bulletin of the Seismological Society of America 71: 1,  
 335-362p., 1981  
 CODEN: BSSAAP ISSN: 0037-1106 30 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English

Latitude: N320000; N400000 Longitude: E0500000; E0420000  
 Descriptors: \*Iran; \*seismology; engineering geology;  
 earthquakes; geologic hazards; ground motion; Asia;  
 Azerbaïjan; seismic risk; seismic sources; epicenters;  
 seismicity; intraplate tectonics; seismotectonics;  
 statistical analysis; probability  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1057740 81-44758

**Effects of temporal variations in seismicity on seismic hazard**

McGuire, R.; Barnhard, T. P.  
 U. S. Geol. Surv., Off. Earthquake Stud., Denver, CO, USA  
 Bulletin of the Seismological Society of America 71: 1,  
 321-334p., 1981  
 CODEN: BSSAAP ISSN: 0037-1106 11 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., sketch maps

Latitude: N200000; N530000 Longitude: E1350000; E0740000  
 Descriptors: \*China; \*seismology; \*Eastern U.S.;  
 earthquakes; engineering geology; geologic hazards; ground  
 motion; Asia; seismicity; history; time variations;  
 probability; statistical analysis; United States;  
 prediction; Mississippi Valley  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1057730 81-44708

**Transmitting boundaries; a closed-form comparison**

Kausel, E.; Tassoulas, J. L.  
 Mass. Inst. Technol., Dep. Civ. Eng., Cambridge, MA, USA  
 Bulletin of the Seismological Society of America 71: 1,  
 143-159p., 1981  
 CODEN: BSSAAP ISSN: 0037-1106 16 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table

Descriptors: \*soil mechanics; \*seismology; elasticity;  
 elastic waves; theoretical studies; propagation;  
 mathematical models; models; elastic properties; finite  
 difference analysis; finite element analysis; statistical  
 methods; S-waves; foundations  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1056572 81-44649

**Dynamic axisymmetric soil model for a flexible ring footing**

El-Shafee, O. M.; Gould, P. L.  
 Wash. Univ., Dep. Civ. Eng., St. Louis, MO, USA  
 Earthquake Eng. Struct. Dyn. 8: 5, 479-498p., 1980  
 CODEN: IJEEBG ISSN: 0098-8847  
 Subfile: B

Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English

Descriptors: \*foundations; \*soil mechanics; seismic  
 response; theoretical studies; loading; ring footings;  
 finite element analysis; statistical methods; mathematical  
 models; models; axisymmetric models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1055347 81-44545

**Cross-plots and histograms for well log analysis in unfamiliar lithologies**

Juepasche, J. M. Stanford, CA, USA  
Stanford Univ., 1978  
Unknownp.  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Descriptors: \*well-logging; \*engineering geology;  
petroleum engineering; graphic methods;  
interpretation; histograms; lithology  
Statistical methods: histograms; lithology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1054136 81-38382

**A comparison of estimates of seismic risk in the central United States**

Howell, B. F., Jr.  
Pa. State Univ., Dep. Geosci., University Park, PA, USA  
Earthquake Notes 51: 2, 13-19p., 1980  
CODEN: EQMAT ISSN: 0012-8287 13 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
2 tables  
Descriptors: \*Midwest; \*seismology; \*engineering geology;  
seismicity; earthquakes; seismic risk; United States;  
environmental geology; maximum likelihood method;  
least-squares analysis; statistical methods; magnitude;  
Mississippi Valley; theoretical studies; Gumbel  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1053824 81-38265

**Geotechnical data bank for Indiana**

Lo, Y. T.  
Purdue Univ., West Lafayette, IN, USA  
574p., 1980  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Latitude: N374500; N414500 Longitude: W0844500; W0881000  
Descriptors: \*Indiana; \*engineering geology; \*automatic data  
processing; practice; civil engineering; United States;  
data bases; statistical methods; soils; engineering  
properties; topography

1053823 81-38260

**Reliability of geotechnical systems**

Hannop-Williams, K. O.  
Rensselaer Polytech. Inst., Troy, NY, USA  
281p., 1980  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: \*foundations; \*slope stability; \*soil mechanics;  
\*earthworks; failure; theoretical studies; prediction;  
probability; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1053162 81-37974

**Effektivnost' gelyemetrii pri reshenii gidrogeologicheskikh inzhenerno-geologicheskikh zadach i Efficiency of helium measurement in solving hydrogeological and engineering-geological problems**

Grafskiy, B. V.; Vegerov, N. N.; Shezhkina, V. Y.  
Sov. Geol. 11: 115-121p., 1980  
CODEN: SVGLA2 ISSN: 0038-5069 6 REFS.  
Subfile: B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Russian  
tables, sketch map  
Descriptors: \*helium; \*hydrogeology; \*rock mechanics;  
geochemistry; applications; theoretical studies; ground  
water; hydraulic fracturing; engineering geology;  
statistical analysis; permeability  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1052390 81-38416

**Shoreline erosion control program at the Northeast Beach**

Lavalle, P. D.  
Univ. Windsor, Dep. Geogr., Windsor, ON, CAN

**Resource allocation issues in the coastal environment**

West, N. (EDITOR)  
Univ. R.I., Dep. Geogr. Mar. Aff., Kingston, RI, USA  
Resource allocation issues in the coastal environment,  
Newport, RI, United States, Nov. 6-8, 1979  
Proceedings of Annual Conference - Coastal Society 5,  
289-303p 1980  
ISSN 0140 1869 3 REFS.

Subfile B  
Country of Publ.: United States  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC

Languages: English  
illus.: 2 tables, sketch maps  
Latitude: N41500; Longitude: W0822500; W0823500  
Descriptors: Ontario; geomorphology; engineering geology  
; processes; shorelines; erosion; Canada; controls;  
programs; Point Pelee; Northeast Beach; bays; beaches;  
trend-surface analysis; statistical methods; sediments;  
flux; renourishment; statistical analysis; Essex County  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1051674 81-38455

**A continuum model on the basis of the double sliding,**

dilatative, free rotating model  
Molenkamp, F.  
Delft. Lab. Grondmechanica, LCM Meded. 21, 2: Tribute to  
Professor De Josselin de Jong, 161-170p., 1980  
11 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

illus.  
Descriptors: soil mechanics; deformation; theoretical  
studies; dilatancy; sand; clastic sediments; loading;  
stress; strain; finite element analysis; statistical  
methods; equations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1050247 81-38396

**The use of cluster analysis in the derivation of**

**geotechnical classifications**  
Judd, A. G.  
Bulletin of the Association of Engineering Geologists 17: 4

193-211p., 1980  
CODEN: ENGEA9 ISSN: 0004-5691 11 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

illus.: tables  
Latitude: N520000; N521000 Longitude: W0004000; W0005000  
Descriptors: England; soil mechanics; automatic data  
processing; engineering geology; methods; statistical  
methods; Europe; Buckinghamshire; Milton Keynes; cluster  
analysis; till; clastic sediments; classification;  
engineering properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1049691 81-38183

**Hybrid modelling of soil-structure interaction**

Gupta, S.; Lin, T.; Penzien, J.; Voh, C.  
Univ. Calif., Earthquake Eng. Res. Cent., Berkeley, CA, USA  
Report - Earthquake Engineering Research Center, College of  
Engineering, University of California, Berkeley, California  
80/09, 120p., 1980  
ISSN: 0271-0323 79 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; REPTY Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: NTIS, Springfield, VA, United States

illus.  
Descriptors: soil mechanics; earthquakes; theoretical  
studies; effects; mathematical models; ground motion;  
structures; models; loading; torsion; finite element  
analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1049031 81-37304

**Electric conductivity of young basaltic rocks of central and South-East Slovakia**

Lastovickova, M.; Kropacek, V.  
 Stud. Geophys. Geod. (Cesk. Akad. Ved) 24: 4, 389-399p., 1980  
 CODEN: SGEGB8 ISSN: 0039-3169 7 REFS.

Subfile: B  
 Country of Publ.: Czechoslovakia  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
 illus., tables, sketch map  
 Latitude: N473000 Longitude: E0224500; FO121000  
 Descriptors: \*Czechoslovakia; \*rock mechanics; \*igneous rocks; \*engineering geology; geophysical surveys; materials properties; basalts; electrical surveys; material conductivity; Europe; basalt; basalt family; materials properties; Alpine Drogeny; Carpathian Drogeny; chemical composition; trace elements; statistical analysis; temperature; volcanic rocks  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

1048502 81-32624

**Scenarios of possible earthquakes affecting major California population centers, with estimates of intensity and ground shaking**

U. S. Geological Survey, USA  
 Open-File Report (United States Geological Survey, 1978)  
 81-0115, 44p., 1981  
 CODEN: XGRUAG ISSN: 0196-1497 21 REFS.

Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; REPORT; MAP Bibliographic Level: MONOGRAPHIC

Languages: English  
 Availability: U. S. Geol. Surv., Open-File Serv. Sect., West. Distrib. Branch, Denver, CO, United States  
 illus., tables; seism. maps  
 Latitude: N323000 Longitude: W1141500; W1243000  
 Descriptors: \*California; \*seismology; earthquakes; engineering geology; geologic hazards; maps; macroearthquakes; magnitude; intensity; seismicity maps; USGS; Ground motion; occurrence; prediction; probability; seismic risk; United States; faults  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1048083 81-32604

**PLUSH: a computer program for probabilistic finite element analysis of seismic soil-structure interaction**

Romo-Domnista, M. P.; Chen, J.; Lysmer, J.; Seed, H. B.  
 Univ. Calif., Earthquake Eng. Res. Cent., Berkeley, CA, USA

Report - Earthquake Engineering Research Center, College of Engineering, University of California, Berkeley, California 77-01, 86p., 1980  
 ISSN: 0271-0323

Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; REPORT Bibliographic Level: MONOGRAPHIC

Languages: English  
 Availability: NTIS, Springfield, VA, United States  
 illus.

Descriptors: \*automatic data processing; \*soil mechanics; earthquakes; engineering geology; theoretical studies; effects; seismic response; PLUSH; computer programs; structures; finite element analysis; statistical methods; mathematical models; models; interaction  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1047970 81-32478

**Injection of cooling water into groundwater**

Rouve, G.; Lukestratkoetter, H.  
 Gonzalez Villarreal, F. (president)  
 International Water Resources Association; Third World congress on water resources, Mexico, 1979  
 Papers - World Congress on Water Resources-Ponencies - Congreso Mundial sobre Aprovechamientos Hidraulicos 3, Vol. 6, 2688-2699p., 1979  
 9 REFS.

Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
 Descriptors: \*ground water; \*waste disposal; \*soil mechanics; \*pollution; industrial waste; materials; properties; thermal pollution; thermal contamination; mass transfer; porous media; contamination; environmental geology; aquifers; heat transfer; materials; properties; finite element analysis; statistical methods; mathematical analysis  
 Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1047395 81-32655  
**Investigation of roof shales in Illinois coal mines**  
 Conroy, P. J.  
 Univ. of Missouri, Rolla, MO, USA  
 unknownp., 1973  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: TMSIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Latitude: N370000 Longitude: W0873000; W0913000  
 Descriptors: Illinois; mining geology; rock mechanics;  
 engineering geology; production control; materials;  
 properties; underground installations; roof control; shale  
 : United States; coal; organic residues; mines;  
 experimental studies; statistical analysis; materials;  
 properties; clastic rocks  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1047395 81-32655  
**Salt dome utilization and environmental considerations.**  
 Baton Rouge, LA, United States, Nov. 22-24, 1976  
 Publ.: La. State Univ., Inst. Environ. Stud.  
 171-187p., 1977  
 19 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.  
 Latitude: N320000 Longitude: W0920000; W0940000  
 Descriptors: Louisiana; structural geology; engineering  
 geology; salt tectonics; waste disposal; United States;  
 salt domes; tiltmeters; long-term storage; radioactive  
 waste; movement; rates; instruments; observations;  
 measurement; finite element analysis; statistical methods;  
 Gulf Coastal Plain; North America; leveling; seismic  
 response; northern Louisiana  
 Section Headings: 16 (STRUCTURAL GEOLOGY)

1046104 81-32081  
**Empirical determination of the gravity anomaly covariance  
 function in mountainous areas**  
 Lachapelle, G.; Schwarz, K. P.  
 Can. Dep. Mines, Energy Resour., Geod. Surv., Ottawa, ON,  
 CAN; Univ. Calgary, CAN  
 The Canadian Surveyor 34: 3, 251-264p., 1980  
 ISSN 0098-5103 11 REFS.  
 Subfile: B  
 Country of Publ.: Canada  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Note Presented at the 17th General assembly of the Int.  
 Assoc. Geod., Canberra, Australia, Dec. 2-14, 1979, illus.,  
 tables, sketch map  
 Latitude: N080000 Longitude: W1010000; W1730000  
 Descriptors: North America; geodesy; maps; geophysical  
 surveys; cartography; surveys; gravity surveys;  
 topographic maps; engineering geology; statistical analysis;  
 regression analysis; free air gravity anomalies; covariance  
 function; Cordillera; altitude; least-squares analysis;  
 statistical methods; geoid  
 Section Headings: 20 (GEOPHYSICS, APPLIED)

1045397 81-32949  
**Discussion on 'Uses and abuses of the finite element method  
 in embankment analysis'**  
 Kuhnay, F. H.  
 Syracuse Univ., Dep. Civ. Eng., Syracuse, NY, USA  
 Trevisan, S. J. (Chairperson)  
 V. O. Congreso panamericano de mecanica de suelos e  
 ingenieria de fundaciones, Buenos Aires, Argentina, Nov.  
 17-22, 1975  
 Congreso Panamericano de Suelos e Ingenieria de  
 Fundaciones-Panamerican Conference on Soil Mechanics and  
 Foundation Engineering 5, Vol. 5, 443-444p., 1975  
 1 REFS.  
 Subfile: B  
 Country of Publ.: Argentina  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Descriptors: dams; automatic data processing;  
 embankments; engineering geology; methods; design;  
 earthdams; rockfill dams; finite element analysis;  
 statistical methods; applications  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1045835 81-31471  
**Monitoring current rates of salt dome movement**  
 Thoms, R. L.; Manning, T. A.  
 La. State Univ., Baton Rouge, LA, USA  
**Salt dome utilization and environmental considerations;**  
 proceedings of a symposium  
 Manning, J. D. (EDITOR); Thoms, R. L. (EDITOR)

1045310 81-33156  
Zastosowanie nieliniowego modelu osadka w analizie rozkladu naprezien i odkształcen gruntu zbrojonego  
A nonlinear medium model for analyzing stress and strain conditions in reinforced soil  
Sulikowska, I.  
Arch. Hydrotech. 27: 1. 79-92p., 1980  
CODEN: AHDRAF ISSN: 0004-0789 6 REFS.  
Subfile: B  
Country of Publ.: Poland  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Polish Summary Languages: English  
illus.: 2 tables  
Descriptors: \*soil mechanics ; materials; properties ; stress; engineering geology; materials, properties; strain; finite element analysis; statistical methods; deformation; mathematical models; models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1045210 81-33076  
Simulation model of failure process of rock and its application to delayed failure  
Nishimatsu, Y.; Yamaguchi, T.; Okubo, S.  
J. Min. Metall. Inst. Jpn. 96: 1111. 593-599p., 1980  
ISSN: 0369-4194 5 REFS.  
Subfile: B  
Country of Publ.: Japan  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Japanese Summary Languages: English  
illus.  
Descriptors: \*rock mechanics; \*automatic data processing ; materials; properties; engineering geology ; failures; failure; finite element analysis; statistical methods; p.t conditions; models; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1043180 81-32731  
Tension resistant inclusions in soils  
Andrawes, K. Z.; McGown, A.; Mashour, M. M.; Wilson-Fahmy, R. F.  
Journal of the Geotechnical Engineering Division 106: GT12, 1313-1326p., 1980  
CODEN: AJGEB6 ISSN: 0093-6405 13 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: sects.  
Descriptors: \*soil mechanics; \*automatic data processing ; deformation; engineering geology ; inclusions; embankments; earthenfill dams; fabric; models; design; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1043179 81-32878  
Liquefaction study; a decision analysis framework  
Haldrup, A.  
Ga. Inst. Technol., Sch. Civ. Eng., Atlanta, GA, USA  
Journal of the Geotechnical Engineering Division 106: GT12, 1297-1312p., 1980  
CODEN: AJGEB6 ISSN: 0093-6405 37 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: \*soil mechanics ; liquefaction ; management; sand; clastic sediments; statistical analysis; engineering geology; methods; earthquakes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1043522 81-33096  
O vezmozhnosti sozdaniya vnutriplastovogo goraniya nefli na Bitervensk mestorozhdenii  
The possible creation of interlayer fire-flooding of petroleum at the Bitervenskiy Deposit  
Rylov, G. M.; Sukhan, V. S.; Zinchuk, M. S.  
Neftepromysl. Delo, Ref. Nauchno-Tekh. Sp. 10. 15-17p., 1980  
ISSN: 0470-6234  
Subfile: B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Russian  
illus.  
Descriptors: \*USSR; \*engineering geology ; petroleum

1043179 81-32878  
Liquefaction study; a decision analysis framework  
Haldrup, A.  
Ga. Inst. Technol., Sch. Civ. Eng., Atlanta, GA, USA  
Journal of the Geotechnical Engineering Division 106: GT12, 1297-1312p., 1980  
CODEN: AJGEB6 ISSN: 0093-6405 37 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: \*soil mechanics ; liquefaction ; management; sand; clastic sediments; statistical analysis; engineering geology; methods; earthquakes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1042371 01042371

Physical property statistics and geologic noise  
Ohoefit, G. R. (investigator)  
Geological Survey Professional Paper (Washington, D.C.)  
1175, 184p., 1980  
CODEN: XGPPA9 ISSN: 0096-0446  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*rock mechanics ; methods ; statistical  
methods  
Section Headings: 17 (GEOPHYSICS, GENERAL)

1041740 81-27152

A numerical approach to predicting stresses and  
displacements around a three-dimensional pressurized fracture  
Kungr, D.; Morgenstern, N. R.  
Univ. Alberta, Dep. Civ. Eng., Edmonton, AB, CAN  
Int. J. Rock Mech. Min. Sci. Geomech. Abstr. 17: 6,  
333-338p., 1980  
ISSN: 0148-9062 11 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*rock mechanics; \*fractures; materials;  
properties; style; joints; stress; displacements;  
three-dimensional models; models; prediction; numerical  
analysis; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1041739 81-27241

The failure of transversely isotropic rocks in triaxial  
compression  
Nova, R.  
Int. J. Rock Mech. Min. Sci. Geomech. Abstr. 17: 6,  
325-332p., 1980  
ISSN: 0148-9062 10 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*rock mechanics; materials; properties;  
isotropic materials; experimental studies; triaxial tests;  
failure plane; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1041737 81-27351

Stereological interpretation of joint trace data; influence  
of joint shape and implications for geological surveys  
Warburton, P. M.  
Int. J. Rock Mech. Min. Sci. Geomech. Abstr. 17: 6,  
305-316p., 1980  
ISSN: 0148-9062 10 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., table  
Descriptors: \*rock mechanics; \*fractures; theoretical  
studies; style; models; joints; statistical analysis;  
prediction; discontinuities  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1041660 81-26907

Seismic hazards estimation study for Vandenberg AFB  
Battis, J. C.  
Air Force Surveys in Geophysics 418, 32p., 1979  
33 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; REPORT Bibliographic Level: MONOGRAPHIC  
Languages: English  
Report No.: AFGL TR 79 0277  
Availability: NTIS, Springfield, VA, United States  
illus., tables, geol. sketch map  
Latitude: N343000; N350000 Longitude: W1230000; W1230000  
Descriptors: \*California; engineering geology; geologic  
hazards; seismic risk; modified Mercalli scale; intensity;  
Point Arguello; Vandenberg Air Force Base; United States;  
faults; statistical methods; ground motion; seismicity;  
acceleration; active faults  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

DIALOG File89: GEOREF - 61-82/Sep (Copr. American Geological Institute) (Item 268 of 1356) User 5208 2sep82

1041153 81-27319

Osiowo-symetryczny stan naprężenia i odkształcenia w próbie  
gruntu wzniesionej wklęsłokal zbrojenia  
Axially symmetric stress and strain conditions in a  
reinforced soil sample

Sulikowska, J.  
Rozpr. Hydrotech. 42. 155-178p., 1980  
CODEN: RZHTAE ISSN: 0035-9394 ISBN: 8307019409 10 REFS.  
Subfile: B  
Country of Publ.: Poland  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Polish  
illus.: 7 tables  
Descriptors: \*soil mechanics; \*materials; \*properties; \*stress; \*materials, properties; \*samples; \*finite element analysis; \*statistical methods; \*strain  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1040222 81-27042

Gebirgsmechanische Aspekte bei der Endlagerung radioaktiver  
Abfälle in Salzlagern unter besonderer Berücksichtigung  
des Pflanzverhaltens von Steinsalz  
Rock mechanical aspects of final storage of radioactive  
waste in salt domes with emphasis on the flow of rock salt  
Albrecht, H.; Mursche, U.

Geowissenschaftliche Gesichtspunkte zur Endlagerung  
radioaktiver Abfallstoffe  
Fortschr. Mineral. 58: 2. 212-247p., 1980  
CODEN: FMRAL ISSN: 0015-8186 71 REFS.  
Subfile: B  
Country of Publ.: Germany, Federal Republic of  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: German  
Summary Languages: English  
illus.: table  
Descriptors: \*rock mechanics; \*deformation; \*waste disposal  
; \*experimental studies; \*radioactive waste; \*salt; \*creep;  
final storage; \*materials, properties; \*flow; \*finite element  
analysis; \*statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1039778 81-26768

Effets de la canalisation a grand gabarit sur la qualite des  
eaux du Doubs  
Effects of the construction of a broad waterway on the water  
quality of the Doubs  
Claton, E.; Monni, D.; Sabeton, C.

Modelling the water quality of the hydrological cycle  
cycle--modification de la qualite de l'eau du cycle  
hydrologique

Modelling the water quality of the hydrological cycle.  
Baden, Austria. Sept. 1978  
Int. Assoc. Hydrol. Sci., Publ. 125. 59-68p., 1973  
CODEN: PIHSD9 ISSN: 0144-7815 3 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: French  
Summary Languages: English  
illus.: sketch map  
Latitude: N470000; N473500 Longitude: E0070000; E0053000  
Descriptors: \*France; \*hydrology; \*engineering geology;  
hydrogeology; surveys; waterways; Doubs River; effects;  
water quality; rivers and streams; hydraulics; dissolved  
materials; oxygen; mathematical models;  
statistical analysis; methods; Europe  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1039771 81-27337

Determination of a friction angle for an alkaline igneous  
rock

Udd, J. E.; Pakalnis, R.  
McGill Univ., Dep. Mining, Metall. Eng., Montreal, PQ, CAN  
Transactions of the Canadian Institute of Mining and  
Metallurgy and of the Mining Society of Nova Scotia 82.  
142-146p., 1979  
CODEN: TCIMAT ISSN: 0371-5701 1 REFS.

Subfile: B  
Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: \*rock mechanics; \*slope stability; \*igneous  
rocks; \*mining geology; \*materials; properties; landslides;  
alkalic composition; production control; shear failure;  
shear stress; methods; friction angles; experimental  
studies; excavations; open-pit mining; cores; statistical  
analysis; discontinuities  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1039769 81-27270

**Ore estimation problems in an erratically mineralized orebody**

Raymond, G.  
Newmont Mines, Similkameen Div., Princeton, BC, CAN  
Transactions of the Canadian Institute of Mining and Metallurgy and of the Mining Society of Nova Scotia 82, 102-110p., 1979  
CODEN: TCIMAT ISSN: 0371-5701 3 REFS.

Subfile: B  
Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables, sketch maps  
Latitude: N500000; W500000 Longitude: W1200000; W1200000  
Descriptors: \*British Columbia; \*mining geology; \*automatic data processing; \*engineering geology; \*production control; \*economic geology; \*open-pit mining; \*copper ores; Canada; \*production; \*copper; \*statistical analysis; Similkameen Mine; \*kriging; \*varlograms; \*sampling; Ingerbella orebody; \*gold; \*silver  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1039802 81-27283

**Application of isotope techniques to the assessment of the consolidation effect on the structure of peats**

Rzeczniczak, J.  
Stud. Geotech. Mech. 2: 1, 73-87p., 1980  
ISSN: 0137-6385

Subfile: B  
Country of Publ.: Poland  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
Descriptors: \*soil mechanics; \*sediments; \*peat; \*isotopes; \*cobalt; \*materials; \*properties; \*organic residues; \*tracers; \*utilization; \*porous materials; Co-60; \*consolidation; \*experimental studies; \*organic sediments; \*porosity; \*tracer experiments; \*seepage; \*fluid flow; \*statistical analysis; \*physical tests  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1039807 81-26956

**Effects of reservoirs in karst areas on earthquakes**

Stojic, P.  
Hydrology Papers 99, 44p., 1980  
CODEN: CHIPAY ISSN: 0069-6110 21 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus.: sketch map

Descriptors: \*Yugoslavia; \*seismology; \*engineering geology; \*earthquakes; \*causes; \*Europe; \*karst; \*reservoirs; \*dams; \*Granarovo Dam; \*Tribanjica River; \*statistical analysis; \*mathematical models; \*models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1037861 81-27234

**Diskriminanzanalytische Untersuchungen zur Identifikation der Ausloesefaktoren fuer Rutschungen in Verschiedenen Hoehenstufen der kolumbianischen Anden**  
Discriminant analysis for identifying the slip factors for landslides at different altitudes in the Colombian Andes

Neuland, H.  
Catena 7: 2-3, 205-221p., 1980  
CODEN: CIJPD3 ISSN: 0341-8162 23 REFS.  
Subfile: B  
Country of Publ.: Germany, Federal Republic of  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables, sketch maps  
Latitude: S040000; N121900 Longitude: W0670000; W0790000  
Descriptors: \*Andes; \*Colombia; \*engineering geology; \*slope stability; \*statistical analysis; \*discriminant analysis; \*statistical methods; \*South America; \*geologic hazards  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

control  
Ceceno, J. M. I.; Maurell, O. S.; Verdecia, L. A. D.

Low-calorie solid resources  
10th world mining congress, Istanbul, Turkey, Sept. 1979  
World Min. Congr., Proc. 10, Vol. 4, 1-15p., 1979  
10 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.: tables, sects., sketch map  
Latitude: N195000; N231500 Longitude: W0740000; W0850000  
Descriptors: \*Cuba; \*mining Geology; \*automatic data  
processing; economic geology; engineering geology;  
production control; copper ores; methods; West India;  
copper; statistical analysis; grade; reserves;  
Mine: San Cayetano Formation; computer programs  
Section Headings: 27 (ECONOMIC GEOLOGY, METALS)

1036686 81-23743

Improved cut-off grade and ore reserve decision through  
geostatistics and a new cost accounting system at the mines of  
Outokumpu Oy  
Niskanen, P.

Low-calorie solid resources  
10th world mining congress, Istanbul, Turkey, Sept. 1979  
World Min. Congr., Proc. 10, Vol. 4, 1-12p., 1979  
3 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.: tables  
Latitude: N594500; N700000 Longitude: E0314500; E0190000  
Descriptors: \*Finland; economic geology; base metals;  
Europe; engineering geology; mining geology; production  
control; reserves; economics; Outokumpu Oy; statistical  
analysis  
Section Headings: 27 (ECONOMIC GEOLOGY, METALS)

1036843 81-23081

The reference-correction method for improving the accuracy  
of seismically locating trapped coal miners

Ruths, M. A.; Greenfield, R. J.  
Chevron Geophys. Co., Houston, Tex., USA; Pa. State Univ.,  
USA

Society of Exploration Geophysicists, 48th annual meeting,  
San Francisco, Calif., United States, Oct. 29-Nov. 2, 1978  
Soc. Explor. Geophys., Annu. Int. Meet., Abstr. 48, 81p.,  
1978

CODEN: SGAMB7  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
Descriptors: \*geophysical methods; \*automatic data  
processing; underground installations; \*geologic hazards;  
mining geology; seismic methods; engineering geology;  
mines; catastrophes; technology; applications; coal;  
organic residues; deposits; techniques; least-squares  
analysis; statistical methods; seismometers;  
computer programs  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1036850 81-23045

Characterization of the average microscopic dimension in  
granular media using ultrasonic pulses: theory and experiments

Plopp, T. J.; Isang, I.  
Schlumberger-Dole Res. Cent., Ridgefield, Conn., USA; Mass.  
Inst. Technol., USA

Society of Exploration Geophysicists, 48th annual meeting,  
San Francisco, Calif., United States, Oct. 29-Nov. 2, 1978  
Soc. Explor. Geophys., Annu. Int. Meet., Abstr. 48, 38-39  
p., 1978

CODEN: SGAMB7  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: \*geophysical methods; \*soil mechanics;  
seismic methods; elasticity; interpretation; theoretical  
studies; elastic waves; acoustical waves; ultrasonic waves;  
granular materials; experimental studies; attenuation;  
statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1036689 81-23658

Variability of grade at Matahambre Mine; measures for its

1036685 81-24100  
**Contribution to the rationalization of drilling pattern for research of low grade coal by geostatistical method**  
 Perisic, M.; Simic, M.  
 materials: Bisan sets bridge; bearing capacity; finite element analysis; statistical methods; creep; shear strength  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1035931 81-23402  
**Rezente Bewegungen im nordlichen Oberrheingraben; Verknuepfung von Messdaten aus Geodasie, Geologie und Bodenmechanik**  
 Recent movement in the northern Upper Rhine Graben; Integration of geodetic, geologic and soil mechanics data  
 Von Fahlbusch, K.; Hein, G.; Kistermann, R.  
 Neues Jahrb. Geol. Palaeontol., Monatsh. 8, 460-476p., 1980  
 CODEN: NJGMA2 ISSN: 0028-3670 14 REFS.  
 Subfile: B  
 Country of Publ.: Germany, Federal Republic of  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: English  
 illus., tables, sketch maps  
 Latitude: N490000; N500000 Longitude: E0090000; E0080000  
 Descriptors: \*West Germany; \*geodesy; \*ground water; \*soil mechanics; \*structural geology; surveys; site exploration; neotectonics; interpretation; Germany; Europe; Upper Rhine Graben; Hesse; regression analysis; least-squares analysis; statistical methods; mathematical models; models; grabens; leveling  
 Section Headings: 24 (SURFICIAL GEOLOGY, QUATERNARY GEOLOGY)

1036371 81-22888  
**Finite element technique for two-dimensional consolidation**  
 Gray, D. G.  
 Inst. Civ. Eng. (Lond.), Proc. 69, Part 2: Research and theory, 535-542p., 1980  
 CODEN: ICEAT ISSN: 0307-8361 6 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*automatic data processing; \*soil mechanics; engineering geology; materials; properties; consolidation; two-dimensional models; models; mathematical models; pore pressure; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1036347 81-23160  
**Foundation of suspension bridge on weathered granite**  
 Yamagata, M.  
 Tauchi-To-Kiso 28: 7(270), 61-66p., 1980  
 3 REFS.  
 Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus., tables, sects.  
 Latitude: N300000; N450000 Longitude: E1470000; E1290000  
 Descriptors: \*Japan; rock mechanics; engineering geology; case studies; foundations; deformation; Asia; weathered

1035043 81-22911  
**Zur Abhaengigkeit der Gesteinsdichte von chemischen Oxidgehalten und Ultraschallgeschwindigkeiten**  
 Dependence of rock density on chemical oxide contents and ultrasonic velocities  
 Heyne, K. H.  
 Z. Angew. Geol. 26: 4, 206-209p., 1980  
 CODEN: ZANGAK ISSN: 0044-2259 2 REFS.  
 Subfile: B  
 Country of Publ.: German Democratic Republic  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: Russian  
 tables  
 Descriptors: \*rock mechanics; materials; properties; density; materials; properties; chemical composition; statistical analysis; regression analysis; factor analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1036371 81-22888  
**Finite element technique for two-dimensional consolidation**  
 Gray, D. G.  
 Inst. Civ. Eng. (Lond.), Proc. 69, Part 2: Research and theory, 535-542p., 1980  
 CODEN: ICEAT ISSN: 0307-8361 6 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*automatic data processing; \*soil mechanics; engineering geology; materials; properties; consolidation; two-dimensional models; models; mathematical models; pore pressure; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1036347 81-23160  
**Foundation of suspension bridge on weathered granite**  
 Yamagata, M.  
 Tauchi-To-Kiso 28: 7(270), 61-66p., 1980  
 3 REFS.  
 Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus., tables, sects.  
 Latitude: N300000; N450000 Longitude: E1470000; E1290000  
 Descriptors: \*Japan; rock mechanics; engineering geology; case studies; foundations; deformation; Asia; weathered

1034059 81-22733

**Mesoscale relationships of talus and insolation, San Juan Mountains, Colorado**

Hyers, A. D.  
Arizona State Univ., Tempe, AZ, USA  
255p., 1980  
Subfile: B

Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Latitude: N370000; N374500 Longitude: W1063000; W1073000  
Descriptors: Colorado; engineering geology; Slope stability; Hinsdale County; Archuleta County; United States; San Juan Mountains; talus slopes; insolation; rockfalls; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1033850 81-22826

**Estimating the probability of occurrence of surface faulting earthquakes on the Wasatch fault zone, Utah**

Cluff, L. S.; Patwardhan, A. S.; Coppersmith, K. J.; Woodward-Clyde Consult., San Francisco, CA, USA

**Special papers on seismicity of the Wasatch Front and Great Basin-Sierra Nevada boundary**

Anderson, E. R. (organizer); Ryall, A. S. (organizer); Smith, R. B. (organizer)  
Conference on earthquake hazards along the Wasatch Front and in the Reno-Carson City area, Alta, UT, United States, July 29-Aug. 1, 1979  
Bulletin of the Seismological Society of America 70: 5, 1463-1478p., 1980  
CODEN: BSSAAP ISSN: 0037-1106 17 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, sketch map  
Latitude: N390000; N421500 Longitude: W1113000; W1123000  
Descriptors: Utah; seismology; faults; engineering; geology; earthquakes; displacements; structural geology; geologic hazards; active faults; seismic risk; neotectonics; Davis County; Utah County; United States; Wasatch Front; seismicity; Wasatch fault; fault zones; Kaysville; Hobbie Creek; probability; prediction; Holocene; Quaternary; normal faults  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1037597 81-23074

**Simple statistics for elastic properties from seismic analysis**

Robinson, L.  
Idaho State Univ., Pocatello, ID, USA  
Seventeenth annual engineering geology and soils engineering symposium, Moscow, ID, United States, April 4-6, 1979  
Proc. Annu. Eng. Geol. Soils Eng. Symp. 17, 219-233p., 1979  
CODEN: EGSSBT ISSN: 0071-0318 4 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: geophysical methods; soil mechanics; seismic methods; elasticity; interpretation; statistical methods; deformation; elastic properties; elastic waves  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1033595 81-22538

**Seepage from partially saturated mine waste disposal systems**

Bloomsburg, G. L.; Bloomfield, R. A.  
Univ. Idaho, Agric. Eng. Dep., Moscow, ID, USA; U. S. Bur. Mines, USA  
Seventeenth annual engineering geology and soils engineering symposium, Moscow, ID, United States, April 4-6, 1979  
Proc. Annu. Eng. Geol. Soils Eng. Symp. 17, 181-196p., 1979  
CODEN: EGSSBT ISSN: 0071-0318 9 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: hydrology; automatic data processing; pollution; ground water; waste disposal; seepage; environmental geology; water; models; finite element analysis; statistical methods; computer programs; UNSAT2; partial saturation; saturated materials; mines; levels; mathematical models; theoretical studies  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1033592 81-23144

**Mathematical modeling approach for delineating landslide hazards in watersheds**

Ward, T. J.; Li, R.; Simons, D. B.  
 Colo. State Univ., Dep. Civ. Eng., Fort Collins, CO, USA  
 Seventeenth annual engineering geology and soils engineering symposium, Moscow, ID, United States, April 4-6, 1979  
 Proc. Annu. Eng. Geol. Soils Eng. Symp. 17, 109-142p., 1979

CODEN: EGSSBT ISSN: 0071-0318 39 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., tables, sketch maps

Latitude: N420000; N462000 Longitude: W1163500; W1243500

Descriptors: "geologic hazards; slope stability;

landslides; watersheds; probability; mathematical models;

models; theoretical studies; Oregon; United States

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1033258 81-22943

**Soil-pile-structure interaction of offshore structures during an earthquake**

Kagawa, T.; Kraft, L. M., Jr.

McClelland Eng., USA

1980 Offshore technology conference, Houston, TX, United States, May 5-8, 1980

Proceedings - Offshore Technology Conference 12, Vol. 3, 235-245p., 1980

CODEN: OSTCBA ISSN: 0160-3663 14 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., tables

Descriptors: "soil mechanics; foundations; earthquakes;

piles; effects; theoretical studies; seismic response;

structures; offshore; loading; finite element analysis;

statistical methods; mathematical models; models

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1032246 81-22810

**Compaction of dry or fluid-filled porous materials**

Carroll, M. M.

Univ. Calif. Berkeley, Dep. Mech. Eng., Berkeley, CA, USA

Second Engineering Mechanics Division specialty conference

; Mechanics of heterogeneous media, Raleigh, NC, United States, 1977

Journal of the Engineering Mechanics Division 106: EMR, 969-990p., 1980

CODEN: JMCEA3 ISSN: 0044-7951 35 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: "rock mechanics; materials; properties;

porous materials; compaction studies; mathematical models;

models; tuff; pyroclastics and glasses; aluminum; igneous

rocks; pyroclastics; clastic rocks; strength; finite

element analysis; statistical methods; theoretical studies

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1032927 81-21761

**Quantitative analysis of tectonic jointing in sediments**

Vuchev, V.

26th international geological congress, Paris, France, July 7-17, 1980

Int. Geol. Congr. Abstr.--Congr. Geol. Int., Resumes 26, 406p., 1980

CODEN: IGABBY

Subfile: B

Country of Publ.: Varies

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: "structural analysis; fractures; rock

mechanics; automatic data processing; style; methods;

structural geology; joints; statistical methods;

quantitative methods; deformation; stress

Section Headings: 16 (STRUCTURAL GEOLOGY)

1031583 81-17266  
**Evaluation of in-situ soil damping characteristics**  
 Shannon & Wilson, Seattle, WA, USA; Agabian Associates.2E1  
 Segundo, CA.3USA  
 170p.. 1980  
 23 REFS.  
 Subfile: B  
 Doc Type: REPORT Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Report No.: NUREG/CR-1638 R6, RA  
 Availability: NTIS, Springfield, VA, United States  
 illus.  
 Descriptors: \*soil mechanics ; materials ; properties ; strain; damping; in situ; stress; experimental studies; applications; hysteresis; loop methods; equilibrium methods ; finite element analysis; statistical methods; impulse testing; shear modulus; elastic constants; sand; clastic sediments; clays  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1031433 81-17906  
**Berechnung von Salzavernen mit Finite-Element-Verfahren**  
**Calculation for salt caverns using the finite element method**  
 Vollstedt, H. W.  
**Fifth symposium on salt**  
 Fifth symposium on salt, Hamburg, Germany, Federal Republic of, May 29-June 1, 1979  
 Symposium on Salt 5, Vol. 1, 451-459p.. 1980  
 3 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: German  
 illus.  
 Descriptors: \*underground installations; \*rock mechanics ; materials ; properties ; stress; salt; methods; stability; strength; experimental studies; mining geology; engineering geology; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1030703 81-17641  
**Otsenka koefitsiyenta poristosti v imogopiasovom**  
**proaktivnom razreze na polskovom etape**  
**Evaluation of the coefficient of porosity in a multi-layered**  
**producing section at the exploratory stage**  
 Korotyshechskiy, M. N.; Koleganov, K. G.  
 Neftegazov. Geol. Geofiz. 4, 10-12p.. 1980  
 CODEN: NFGSAX ISSN: 0028-1182

Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Russian  
 illus.. table  
 Descriptors: \*engineering geology; \*sedimentary rocks ; petroleum engineering; properties ; site exploration; porosity; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1030676 81-17561  
**Sull'identificazione numerica di alcuni parametri geotecnici**  
**Numerical identification of some geotechnical parameters**  
 Giuda, G.  
 Riv. Ital. Geotec. 13, 2, 94-105p.. 1979  
 CODEN: RITGAI ISSN: 0557-1405 16 REFS.  
 Subfile: B  
 Country of Publ.: Italy  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Italian Summary Languages: English  
 illus.  
 Descriptors: \*soil mechanics; \*automatic data processing ; materials ; properties; engineering geology ; numerical analysis; clays; theoretical studies; in situ; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1030672 81-17494  
**Sull'impiego dell'analisi fattoriale nella esplorazione geotecnica del sottosuolo**  
**Use of factor analysis in geotechnical exploration of the subsurface**  
 Crespellani, T.; Loi, A.  
 Riv. Ital. Geotec. 13, 3, 176-193p.. 1979  
 CODFN: RITGAI ISSN: 0557-1405 21 REFS.  
 Subfile: B  
 Country of Publ.: Italy  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Italian Summary Languages: English  
 illus.. tables  
 Descriptors: \*engineering geology ; site exploration ; factor analysis; theoretical studies; mathematical models; models; exploration; statistical methods; clays; sand; clastic sediments  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1030672 81-17494  
**Sull'impiego dell'analisi fattoriale nella esplorazione geotecnica del sottosuolo**  
**Use of factor analysis in geotechnical exploration of the subsurface**  
 Crespellani, T.; Loi, A.  
 Riv. Ital. Geotec. 13, 3, 176-193p.. 1979  
 CODFN: RITGAI ISSN: 0557-1405 21 REFS.  
 Subfile: B  
 Country of Publ.: Italy  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Italian Summary Languages: English  
 illus.. tables  
 Descriptors: \*engineering geology ; site exploration ; factor analysis; theoretical studies; mathematical models; models; exploration; statistical methods; clays; sand; clastic sediments  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1030666 81-17740

**Interazione dinamica terreno-struttura in una pila da ponte fondata su pali**  
**Dynamic soil-structure interaction in a pile of a bridge on pile foundations**  
 Nuti, C.

Riv. Ital. Geotec. 14: 1, 9-26p., 1980  
 CODEN: RITGAI ISSN: 0557-1405 12 REFS.

Subfile: B  
 Country of Publ.: Italy  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Italian Summary Languages: English  
 illus., table

Descriptors: \*foundations; \*soil mechanics; \*piles; seismic response; sand; clastic sediments; Poisson's ratio; elastic constants; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1030441 81-17834

**Reconstruction of stress fields for the Aegean by a finite element model**

Shulman, M.; Skala, W.

**Tectonic stresses in the Alpine-Mediterranean region**

Scheidegger, A. L. (EDITOR)  
 Working Group 3, Interunion Commission of Geophysics and the European Geophysical Society symposium on tectonic stresses in the Alpine-Mediterranean region, Vienna, Austria, Sept. 13-14, 1979

Rock Mech., Suppl., 9, 245-255p., 1980  
 ISSN: 0080-3375 ISBN: 3211815783-0387815783 30 REFS.

Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.

Latitude: N360000; Aegean Sea; Turkey; \*Greece; \*faults  
 Descriptors: \*geology; structural geology; seismology; engineering geology; tectonics; neotectonics; stress; mechanics; Mediterranean Sea; theoretical studies; Middle compression; evolution; lineaments; fractures  
 East: Europe; tectonics; finite element analysis; statistical methods; numerical models; Quaternary; stress fields; aerial photography; Holocene; processes  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1030441 81-17717

**Stress distribution in overthrusting slabs and mechanics of**

**Jura deformation**

Mueller, W. H.; Hsu, K. J.

**Tectonic stresses in the Alpine-Mediterranean region**  
 Scheidegger, A. L. (EDITOR)  
 Working Group 3, Interunion Commission of Geophysics and the European Geophysical Society symposium on tectonic stresses in the Alpine-Mediterranean region, Vienna, Austria, Sept. 13-14, 1979

Rock Mech., Suppl., 9, 219-232p., 1980  
 ISSN: 0080-3375 ISBN: 3211815783-0387815783 33 REFS.

Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English

Note: Laboratory of Experimental Geology, Zurich, Switzerland, Contrib. No. 145, illus., table, sects.  
 Latitude: N454500; Longitude: E0103000; E0055000  
 Descriptors: \*Switzerland; \*orogeny; \*Alps; \*faults; engineering geology; tectonophysics; structural geology; evolution; displacements; rock mechanics; crust; neotectonics; Alpine orogeny; thrust faults; Europe; tectonics; Jura Mountains; stress; overthrust faults; layered materials; theoretical studies; anhydrite; sulfates; limestone; carbonate rocks; crystalline basement rocks; underthrust faults; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1030345 81-17748

**Surface settlements due to shield tunnelling in Rome**

Ottaviani, M.; Cappellari, G.

Int. Assoc. Eng. Geol., Bull., 21, 15-20p., 1980  
 CODEN: BIEGB6 ISSN: 0074-1612 6 REFS.

Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., tables, sect.  
 Latitude: N4363000; N473000 Longitude: E0190000; E0063000  
 Descriptors: \*Italy; engineering geology; tunnels; Europe; settlement; soil mechanics; finite element analysis; statistical methods; stress; strain  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1029223 81-16292  
A finite element method for studying the transient non-linear thermal creep of geological structures  
Anderson, C. A.; Bridwell, R. J.  
Los Alamos Sci. Lab., Los Alamos, NM, USA  
Int. J. Numer. Anal. Methods Geomech. 4: 3, 255-276p., 1980  
ISSN: 0363-9061 15 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.

1029206 81-17880  
Finite element analyses of isotropic and anisotropic cohesive soils with a view to correctly predicting impending collapse  
Toh, C. T.; Sloan, S. W.  
Int. J. Numer. Anal. Methods Geomech. 4: 1, 1-23p., 1980  
ISSN: 0363-9061 19 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.

1029148 81-16262  
Fracture densities in the Rattlesnake Mountain fold, Wyoming  
Goodwin, E. R. K.  
Univ. of Oklahoma, Norman, OK, USA  
unknownimp., 1975  
Subfile: B  
Degree Level: Master  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Latitude: N420000 Longitude: W1060000; W1070000  
Descriptors: Wyoming; structural analysis; rock mechanics  
; sedimentary rocks; structural geology; fractures; field studies; carbonate rocks; strain; Natrona County; Big Horn Formation; United States; dolostone; Rattlesnake Mountain; folds; probability; Basin and Range Province  
Section Headings: 16 (STRUCTURAL GEOLOGY)

1029214 81-17805  
Vertical and horizontal land deformation due to fluid withdrawal  
Safai, N. M.; Pinder, G. F.  
Princeton Univ., Dep. Civ. Eng., Princeton, NJ, USA  
Int. J. Numer. Anal. Methods Geomech. 4: 2, 131-142p., 1980  
ISSN: 0363-9061 19 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables

1029207 81-17611  
Finite element models for rock fracture mechanics  
Ingraffea, A. R.; Houze, F. E.  
Cornell Univ., Sch. Civ. and Environ. Eng., Ithaca, NY, USA  
Univ. Colo., USA  
Int. J. Numer. Anal. Methods Geomech. 4: 1, 25-43p., 1980  
ISSN: 0363-9061 24 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

1029205 81-17880  
Finite element analyses of isotropic and anisotropic cohesive soils with a view to correctly predicting impending collapse  
Toh, C. T.; Sloan, S. W.  
Int. J. Numer. Anal. Methods Geomech. 4: 1, 1-23p., 1980  
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Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.

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ISSN: 0363-9061 19 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
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ISSN: 0363-9061 19 REFS.  
Subfile: B  
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ISSN: 0363-9061 24 REFS.  
Subfile: B  
Country of Publ.: International  
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Toh, C. T.; Sloan, S. W.  
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Subfile: B  
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Languages: English  
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1029207 81-17611  
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ISSN: 0363-9061 24 REFS.  
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ISSN: 0363-9061 19 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
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ISSN: 0363-9061 24 REFS.  
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Int. J. Numer. Anal. Methods Geomech. 4: 1, 1-23p., 1980  
ISSN: 0363-9061 19 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.

1029207 81-17611  
Finite element models for rock fracture mechanics  
Ingraffea, A. R.; Houze, F. E.  
Cornell Univ., Sch. Civ. and Environ. Eng., Ithaca, NY, USA  
Univ. Colo., USA  
Int. J. Numer. Anal. Methods Geomech. 4: 1, 25-43p., 1980  
ISSN: 0363-9061 24 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

1029205 81-17880  
Finite element analyses of isotropic and anisotropic cohesive soils with a view to correctly predicting impending collapse  
Toh, C. T.; Sloan, S. W.  
Int. J. Numer. Anal. Methods Geomech. 4: 1, 1-23p., 1980  
ISSN: 0363-9061 19 REFS.  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.

1028724 81-17183  
**Petrofizika osadochnykh porod v glubinykh usloviyakh**  
**Petrophysics of sedimentary rocks under conditions of great depth**  
 Avchyan, G. M.; Matveyenko, A. A.; Stefankevich, Z. B.  
 Publ.: Izd. Nedra  
 224p., 1979  
 164 REFS.  
 Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: BOOK Bibliographic Level: MONOGRAPHIC  
 Languages: Russian  
 illus.  
 Descriptors: \*rock mechanics; \*sedimentary rocks; experimental studies; diagenesis; dynamics; fabric; structure; chemical composition; mineral composition; deformation; numerical analysis; porosity; statistical analysis; compression  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1028088 81-16803  
**Issledovaniya anomalii seysmookusticheskoy aktivnosti ugol'nykh plastov Donbassa**  
**Seismo-acoustical anomalies in coal seams of the Donets Basin**  
 Glushko, V. T.; Ivanov, V. S.; Khokholev, V. K.  
**Vnezapnye vybrosy na bol'shikh glubinakh; sbornik nauchnykh trudov**  
 Abramov, F. A. (EDITOR); Zabitayto, V. Y. (EDITOR); Zorin, A. N. (EDITOR); Shevlev, G. A. (EDITOR)  
 Publ.: Izd. Nauk. Dumka  
 33-40p., 1979  
 5 REFS.  
 Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: Russian  
 illus.  
 Latitude: N470000; N483000 Longitude: E0400000; E0373000  
 Descriptors: \*USSR; \*mining geology; geophysical surveys; engineering geology; concepts; seismic surveys; geologic hazards; rock bursts; mathematical models; models; Donets Basin; Ukraine; statistical methods  
 Section Headings: 20 (GEOPHYSICS, APPLIED)

1027526 81-18860  
**Grain size analysis and petrographic examination of a gravel deposit relative to engineering quality, W. Lafayette, Indiana**  
 West, T. R.; Dikagbu, C.  
 Purdue Univ., Dep. Geosci., West Lafayette, Indiana, USA  
 The Geological Society of America, North-Central Section, 14th annual meeting, Bloomington, Indiana, United States, April 10-11, 1980  
 Geol. Soc. Am., Abstr. Programs 12: 5, 26p., 1980  
 CODEN: GAAPBC ISSN: 0016-7592  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N402000 Longitude: W0865000; W0865500  
 Descriptors: \*Indiana; \*sediments; \*soil mechanics; \*rock mechanics; \*economic geology; \*clastic sediments; materials; properties; gravel deposits; Tippecanoe County; United States; West Lafayette; petrography; textures; grain size; gravel; deposits; statistical analysis; engineering properties; terraces; Wabash River; materials, properties; construction materials; aggregate  
 Section Headings: 28 (ECONOMIC GEOLOGY, NONMETALS)

1027926 81-17583  
**FEM study of elastic phase of pressuremeter test**  
 Hartman, J. P.; Scherzmann, J. H.  
 Fla. Technol. Univ., Dep. Civ. Eng., Orlando, FL, USA; Univ. Fla., USA

1025511 81-13047  
**A model with non-reflecting boundaries for use in explicit soil-structure interaction analyses**  
 Kunar, R. R.; Rodriguez-Ovejero, L.  
 Principia Mech., London, GBR; Dames and Moore, GBR  
 Earthquake Eng. Struct. Dyn. 8: 4, 361-374p., 1980  
 CODEN: IJEEBG ISSN: 0098-8847 25 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*soil mechanics; \*earthquakes; \*foundations; \*theoretical studies; seismic response; effects; mathematical models; structures; models; non-reflecting boundaries; elastic waves; finite element analysis; statistical methods; finite difference analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1025510 81-13189  
**Seismicity and seismic intensities in Jamaica, West Indies; a problem in risk assessment**  
 Shepherd, J. B.; Aspinall, W. P.  
 Earthquake Eng. Struct. Dyn. 8: 4, 315-335p., 1980  
 CODEN: IJEEBG ISSN: 0098-8847 42 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, geol. sketch maps  
 Latitude: N180000; N210000 Longitude: W0720000; W0820500  
 Descriptors: \*Jamaica; \*seismology; engineering geology; seismicity; earthquakes; West Indies; seismic risk; seismic intensity; history; seismotectonics; Caribbean Plate; North American Plate; Cayman Trough; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1027159 81 12889  
**Estimating the probability of occurrence of surface faulting on the Wasatch fault zone, Utah**  
 Cluff, L. S.; Patwardhan, A. S.; Copper-Smith, K. J.  
 Woodward Clyde Consult., San Francisco, CA, USA  
**Proceedings of Conference X; Earthquake hazards along the Wasatch and Sierra-Nevada frontal fault zones**  
 Evernden, J. F. (COMPILER)  
 Conference X; Earthquake hazards along the Wasatch and Sierra-Nevada frontal fault zones. Alta, UT, United States, July 29-Aug 1, 1979  
 U S Geol. Surv., Open-File Rep. 80-801, 276-298p., 1980  
 CONFEN XGRDAG ISSN: 0196-1497 16 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL REPORT; CONFERENCE PUBLICATION  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Availability: U. S. Geol. Surv., Open-File Serv. Sect., Branch Distrib., Denver, CO, United States  
 illus., tables, sketch map  
 Latitude: N390000; N420000 Longitude: W110000; W1130000  
 Descriptors: \*Utah; \*seismology; \*faults; earthquakes; engineering geology; displacements; geologic hazards; seismic risk; active faults; Wasatch Front; Wasatch Fault; United States; fault zones; neotectonics; probability  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1025570 81-13158  
**Simple statistics to improve refraction seismic results**  
 Robinson, L.  
 Idaho State Univ., Pocatello, ID, USA  
 Sixteenth annual engineering geology and soils engineering symposium, Boise, ID, United States, April 5-7, 1978  
 Proc. Annu. Eng. Geol. Soils Eng. Symp. 16, 183-199p., 1978  
 CODEN: EGS5RT ISSN: 0071-0318 4 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*geophysical methods; \*soil mechanics; seismic methods; methods; interpretation; statistical methods; refraction methods; regression analysis; errors; velocity; depth  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1024735 81-13185

**Preliminary results on comparison of adsorption-desorption methods and statistical techniques to generate Kd predictor equations**

Serie, R. J.; Rai, D.; Relyea, J. F.  
Pac. Northwest Lab., Richland, WA, USA

**Proceedings of the Workshop on The migration of long-lived radionuclides in the geosphere--Compte rendu d'une reunion de travail sur la migration des radionuclides a vie longue dans la geosphere**

The migration of long-lived radionuclides in the geosphere, Brussels, Belgium, Jan. 29-31, 1979  
Publ.: OECD Nucl. Energy Agency/Comm. Eur. Communities  
63-77P., 1979  
27 REFS.

Subfile: B

Country of Publ.: France  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: waste disposal; radioactive waste; storage legislation; automatic data processing; engineering geology; adsorption; desorption  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1024128 81-12790

**Investigation of fracture traces and underground roof fall fatalities in the Southern Anthracite Field, Pennsylvania**

Petrus, C. A.  
Pennsylvania State Univ., University Park, Pa., USA  
unknown., 1979

Subfile: B

Degree Level: Master's  
Country of Publ.: United States  
Doc Type: THESIS; MAP Bibliographic Level: MONOGRAPHIC  
Languages: English  
text; map

Latitude: N394500; Longitude: W0744500; W0803500  
Descriptors: Pennsylvania; fractures; engineering geology; structural geology; patterns; mining geology; geologic hazards; lineaments; United States; Southern Anthracite coal field; fracture trace map; Minersville Quadrangle; Pine Grove Quadrangle; Tamaque Quadrangle; Lower City Quadrangle; Tremont Quadrangle; mine accidents; mine fatalities; land subsidence; coal mines; faults; mine roof falls; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1023414 81-13204

**A simple device for the direct shear-strength testing of intact rock**

Stacey, T. R.  
S. Afr. Inst. Min. Metall., J. 80: 3, 129-130p., 1980  
ISSN: 0038-223X 3 REFS.

Subfile: B

Country of Publ.: South Africa  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: plate

Descriptors: rock mechanics; materials; properties; shear strength; methods; instruments; statistical analysis; experimental studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1022655 81-13254

**On the determination of stress state in the simple shear apparatus**

Wood, D. M.; Drescher, A.; Budhu, M.  
Geotech. Test. J. 2: 4, 211-222p., 1979  
CODEN: GTU00U ISSN: 0149-6115 15 REFS.

Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: soil mechanics; materials; properties; sand; mathematical models; models; shear stress; clastic sediments; materials; properties; experimental studies; grain size; friction; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1022654 81-13021  
**Comparisons of field density test results**  
 Kernerbach, T. J.; Ferris, W. R.  
 Lau Engin. Fest. Co., Miami, FL, USA; Bechtel, San Francisco, Calif., USA  
 Geotech. Test. J. 2, 4, 206-210p., 1979  
 CODEN GTJDDJ ISSN 0149-6115  
 Subfile B  
 Country of Pub.: United States  
 Doc Type SERIAL Bibliographic Level: ANALYTIC  
 Languages English  
 illus., tables  
 Descriptors: \*soil mechanics; \*materials; \*properties; sand; \*materials, properties; \*compaction; grain size; \*clastic sediments; \*statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1022651 81-13195  
**Automated data acquisition, transducers, and dynamic recording for the geotechnical testing laboratory**  
 Silver, M. L.  
 Geotech. Test. J. 2, 4, 185-189p., 1979  
 CODEN GTJDDJ ISSN 0149-6115 1 REFS.  
 Subfile B  
 Country of Pub.: United States  
 Doc Type SERIAL Bibliographic Level: ANALYTIC  
 Languages English  
 illus., tables  
 Descriptors: \*automatic data processing; \*engineering geology; \*data acquisition; \*statistical analysis; \*data storage  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1021150 81-08270  
**Lesung von Fragen der Stabilität des Liegenden im Sokolover Braunkohlenrevier (CSSR) unter Beachtung der Thermalquellen**  
 Study of the stability of the underlying bed in the Sokolov lignite district (Czechoslovakia) taking the hot springs into account  
 Siska, L.; Aldorf, J.; Korinek, R.  
 Neue Bergbautech. 10, 3, 150-153p., 1980  
 CODEN NEBBAB ISSN: 0047-9403 2 REFS.  
 Subfile B  
 Country of Pub.: German Democratic Republic  
 Languages German  
 Note Presented at Bergakademie Freiberg on Berg and Huettenmaennischer Tag, Colloquium 1, June 1979. illus., tables  
 Descriptors: \*Czechoslovakia; \*soil mechanics; \*engineering

1020045 81-07696  
**Izotopnyye issledovaniya v gidrogeologii i inzhenernoy geologii**  
**Isotope studies in hydrogeology and engineering geology**  
 Dubinchuk, V. T. (EDITOR); Polyakov, V. A. (EDITOR)  
 Vses. Nauchno-Issled. Inst. Gidrogeol. Inzh. Geol., Tr., N. S. 131, 91p., 1979  
 ISSN: 0541-1025  
 Subfile B  
 Country of Pub.: Union of Soviet Socialist Republics  
 Doc Type SERIAL Bibliographic Level: MONOGRAPHIC  
 Languages Russian  
 Note Individual articles are cited separately. illus., tables  
 Descriptors: \*isotopes; \*carbon; \*soils; \*ground water; \*chemistry; \*geochemistry; \*C-14; \*mathematical methods;  
 Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

1019886 81-08109  
**Method for specifying soil compaction**  
 Essigmann, M. F., Jr.; Altschaeffl, A. G.; Lovell, C. W.  
 Lincoln-Devore Test Lab., Colorado Springs, Colo., USA; Purdue Univ., Dep. Civ. Eng., West Lafayette, Indiana, USA  
**Stabilization and compaction**  
 Transp. Res. Rec. 690, 29-34p., 1978  
 CODEN TRERDM ISSN: 0361-1981 ISBN: 0308028361 15 REFS.  
 Subfile B  
 Country of Pub.: United States  
 Doc Type SERIAL Bibliographic Level: ANALYTIC  
 Languages English  
 illus., tables  
 Descriptors: \*soil mechanics; \*automatic data processing; \*experimental studies; \*engineering geology; \*consolidation; \*mathematical models; \*models; \*statistical analysis; \*density; \*moisture; \*data analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1021150 81-08270  
**Lesung von Fragen der Stabilität des Liegenden im Sokolover Braunkohlenrevier (CSSR) unter Beachtung der Thermalquellen**  
 Study of the stability of the underlying bed in the Sokolov lignite district (Czechoslovakia) taking the hot springs into account  
 Siska, L.; Aldorf, J.; Korinek, R.  
 Neue Bergbautech. 10, 3, 150-153p., 1980  
 CODEN NEBBAB ISSN: 0047-9403 2 REFS.  
 Subfile B  
 Country of Pub.: German Democratic Republic  
 Languages German  
 Note Presented at Bergakademie Freiberg on Berg and Huettenmaennischer Tag, Colloquium 1, June 1979. illus., tables  
 Descriptors: \*Czechoslovakia; \*soil mechanics; \*engineering

1019885 81-08191  
Using indicative properties to predict the density-moisture  
relationship of soils  
Livneh, M.; Ishal, I.  
Stabilization and compaction  
Transp. Res. Rec. 690, 22-28p., 1978  
CODEN: TRREDM ISSN: 0361-1981 ISBN: 0309028361 15 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: \*soil mechanics; \*highways ; materials;  
properties; foundations ; clays; pavement; methods;  
statistical analysis; materials, properties; density;  
moisture; embankments  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1019884 81-08301  
Storage, retrieval, and analysis of compacted shale data  
van Zyl, D. J. A.; Wood, L. E.; Lovell, C. W.; Sistiiano, W.  
Purdue Univ., Dep. Civ. Eng., West Lafayette, Indiana, USA;  
Indiana State Highw. Comm., Indianapolis, Indiana, USA

Stabilization and compaction  
Transp. Res. Rec. 690, 14-22p., 1978  
CODEN: TRREDM ISSN: 0361-1981 ISBN: 0309028361 7 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables

Latitude: N374500; N414500 Longitude: W0844500; W0881000  
Descriptors: \*Indiana; \*soil mechanics; \*automatic data  
processing; \*highways ; engineering geology; materials;  
properties; foundations ; shale; pavement; United States;  
data analysis; data storage; data retrieval; materials,  
properties; clastic rocks; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1019878 81-08247  
Predicting field compacted strength and variability  
Price, J. T.; Altscheiff, A. G.; Lovell, C. W.  
Purdue Univ., Dep. Civ. Eng., West Lafayette, IN, USA  
Subdrainage and soil moisture  
Transp. Res. Rec. 705, 42-48p., 1979  
CODEN: TRREDM ISSN: 0361-1981 ISBN: 0309029511 10 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Latitude: N374500; N414500 Longitude: W0844500; W0881000  
Descriptors: \*soil mechanics; \*Indiana ; materials;  
properties; engineering geology ; shear strength; highways;  
materials, properties; density; moisture; consolidation;  
statistical analysis; embankments; foundations; United  
States; experimental studies; pavement  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1019877 81-08291  
Subgrade stability  
Thompson, M. R.  
Univ. Ill., Dep. Civ. Eng., Urbana, IL, USA  
Subdrainage and soil moisture  
Transp. Res. Rec. 705, 32-41p., 1979  
CODEN: TRREDM ISSN: 0361-1981 ISBN: 0309029511 25 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: table  
Latitude: N370000; N423000 Longitude: W0873000; W0813000  
Descriptors: \*soil mechanics; \*highways; \*Illinois ;  
materials; properties; foundations; engineering geology ;  
strength; pavement; materials, properties; testing;  
deformation; moisture; drainage; consolidation; stress;  
loading; bearing capacity; shear strength; United States;  
finite element analysis; statistical methods; granular  
materials  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1019842 81-06957

Issledvaniya po matematicheskoj geologii  
Research in mathematical geology  
Romanova, M. A. (EDITOR); Sapogov, N. A. (EDITOR)  
Publ.: Izd. Nauka  
231p., 1978  
Subfile: B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: BOOK Bibliographic Level: MONOGRAPHIC  
Languages: Russian  
Note: Individual articles within scope are cited separately.  
illus., tables  
Descriptors: \*mathematical geology; theoretical studies; statistical analysis; mathematical methods; numerical analysis; petrology; mathematical models; engineering geology; economic geology; trend-surface analysis; statistical methods; multivariate analysis; paragenesis; Markov chain analysis; computer programs; regression analysis; crosscorrelation  
Section Headings: 15. (MISCELLANEOUS & MATHEMATICAL GEOLOGY)

1019704 81-08240

Finite element analysis applied to rock mechanics problems in underground mining of bauxite  
Passaris, E. K. S.

Bauxites  
Augustithis, S. S. (chairperson)  
4th international congress for the study of bauxites, alumina, and aluminum, Athens, Greece, Oct. 9-12, 1978  
[Pap.]. - Int. Congr. Stud. Bauxites, Alumina Alum. (ICSORA) 4, Vol. 2, 704-714p., 1978  
7 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: \*automatic data processing; \*rock mechanics; \*bauxite; engineering geology; production; materials; properties; methods; mining geology; computers; simulation; in situ; finite element analysis; statistical methods; stress; loading; stability; exploration  
Section Headings: 22. (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1019163 81-08041

Analysis of an underground opening in jointed rock  
Rodriguez Perez, C. E.  
Univ. of Illinois, Urbana, IL, USA  
226p., 1980

Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Latitude: N384R00; N390000 Longitude: W076S300; W0770700  
Descriptors: \*District of Columbia; \*rock mechanics; engineering geology; case studies; underground installations; subways; United States; Dupont Circle; tunnels; joints; fractures; shear zones; finite element analysis; statistical methods; excavations; site exploration  
Section Headings: 22. (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018945 81-08120

In-situ stress determination based on fracture responses associated with coring operations  
Gangarao, H. V. S.; Chang, P.; Advani, S. H.  
20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
Sym. Rock Mech., Proc. 20, 683-690p., 1979  
CODEN: PSRMA6 ISSN: 0586-3031 18 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, plate

Descriptors: \*rock mechanics; experimental studies; finite element analysis; cores; stress; fractures; statistical methods; Devonian; paleozoic; shale; clastic rocks; methods; mathematical models; models  
Section Headings: 22. (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018930 81-08082

Comparison of finite element predictions of horizontal elastic rock movements to field measurements in an excavation in New York City

Ciancia, A. J.; Millet, R. A.; Dorrler, R. C.  
Woodward-Clyde Consult., USA  
20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
Symp. Rock Mech., Proc. 20, 555-564p., 1979  
CODEN: PSRMA6 ISSN: 0586-3031 13 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, geol. sketch map, geol. sects.  
Latitude: N403000 Longitude: W0735500; W0735500  
Descriptors: \*rock mechanics; \*New York ; materials; properties; engineering geology ; finite element analysis; Fordham Gneiss; mathematical models; models; statistical methods; excavations; granite gneiss; gneisses; New York City; United States; Queens; stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018929 81-08238

Elastic-plastic and elastic-brittle finite element analysis of cave zone growth in response to longwall fall advance

Perisenu, W. G.  
Univ. Utah, Salt Lake City, UT, USA  
20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
Symp. Rock Mech., Proc. 20, 541-553p., 1979  
CODEN: PSRMA6 ISSN: 0586-3031 28 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., sects., strat. cols., sketch map  
Descriptors: \*rock mechanics; \*Utah ; materials; properties; engineering geology ; finite element analysis; sandstone; mathematical models; models; statistical methods ; longwall mining; United States; Sunnyside Mine; pressure ; elasticity; strain; deformation; clastic rocks; coal; organic residues  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018927 81-08096

A parametric study of a discontinuous rock medium and its effects on the design of an underground structural support using a two-dimensional finite element technique

Dendrou, B.; Van Dillen, D.; Sennett, R. E.  
Aghabian Assoc.  
20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
Symp. Rock Mech., Proc. 20, 525-533p., 1979  
CODEN: PSRMA6 ISSN: 0586-3031 10 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: \*rock mechanics; \*District of Columbia ; materials; properties; engineering geology ; finite element analysis; mathematical models; models; roof support; statistical methods; excavations; stress; elasticity; strength; tunnels; two-dimensional models; Dupont Circle Station; subways; gneiss; gneisses; discontinuities; joints; fractures  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018903 81-08120

Probability of kinematic instability in rock slopes: a numerical approach

Glynn, E. F.; Einstein, H. H.  
Univ. Pa., Philadelphia, PA, USA; Mass. Inst. Technol., USA  
20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
Symp. Rock Mech., Proc. 20, 317-325p., 1979  
CODEN: PSRMA6 ISSN: 0586-3031 6 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: \*rock mechanics; \*slope stability ; theoretical studies ; mathematical methods; numerical analysis; errors; joints; fractures; kinetics; kinematics ; slopes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018897 81-08277

**Statistics of structural responses to seismic waves filtered through rock and soil formations**

Spanos, P. I. D.  
Univ. Tex. Austin, Austin, TX, USA  
20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
Sym. Rock Mech., Proc. 20, 273-278p., 1979  
CODEN: PSRMA6 ISSN: 0586-3031 11 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., sect.  
Descriptors: \*rock mechanics; \*seismology; theoretical studies; elastic waves; mathematical models; statistical methods; earthquakes; probability; damping; frequency  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018896 81-08320

**Numerical analysis of rock structures considering material nonlinearities**

Yufin, S. A.  
20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
Sym. Rock Mech., Proc. 20, 265-272p., 1979  
CODEN: PSRMA6 ISSN: 0586-3031 14 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., sects., table  
Descriptors: \*rock mechanics; \*USSR; \*automatic data processing; theoretical studies; engineering geology; mathematical methods; numerical analysis; underground installations; finite element analysis; statistical methods; joints; fractures; computer programs; Inguri hydroelectric plant; Caucasus; Georgia; United States; dolostone; carbonate rocks; shale; clastic rocks; sandstone; slate; slates; sedimentary rocks  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018895 81-08100

**On the inference of crack statistics from observations of an outcropping**

Dienes, J. K.  
Los Alamos Sci. Lab., Los Alamos, NM, USA; Univ. Calif., USA  
20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979

States, June 4-6, 1979  
Sym. Rock Mech., Proc. 20, 259-263p., 1979  
CODEN: PSRMA6 ISSN: 0586-3031 7 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: \*rock mechanics; theoretical studies; mathematical methods; cracks; Hankel functions; distribution; outcrops  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018894 81-08300

**A two-dimensional finite element technique for modeling rock/structure interaction of a lined underground opening**

Van Dillen, D.; Fellner, R. W.; Dendrou, B.  
Agablian Assoc., El Segundo, CA, USA  
20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
Sym. Rock Mech., Proc. 20, 251-258p., 1979  
CODEN: PSRMA6 ISSN: 0586-3031

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., block diag.  
Descriptors: \*rock mechanics; theoretical studies; mathematical models; excavations; finite element analysis; statistical methods; two-dimensional models; layered materials  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018021 81-08237

Parametric analysis of axially loaded concrete piles in non-homogeneous cohesive and cohesionless soil deposits

Parikh, S. K.; Pal, S. C.

Numerical methods in geomechanics; Vol. 4, Additional contributions

Witke, W.(EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1531-1538

P., 1980

ISBN: 9061910447 6 REFS.

Subfile: B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., tables

Descriptors: \*foundations; \*deformation; \*soil mechanics; piles; elasticity; materials; properties; stress; loading; cohesionless materials; shear stress; heterogeneity; failure; finite element analysis; statistical methods; penetration; cohesive materials; materials, properties

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018018 81-08085

Prediction of supported excavation movements under marginal stability conditions in clay

Clough, G. W.; Hansen, L. A.; Mana, A. I.

Stanford Univ., Stanford, CA, USA; Ariz. State Univ., USA

Numerical methods in geomechanics; Vol. 4, Additional contributions

Witke, W.(EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1485-1502

P., 1980

ISBN: 9061910447 21 REFS.

Subfile: B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: \*foundations; \*soil mechanics; construction; deformation; excavations; loading; stress; stiff clay; finite element analysis; statistical methods; numerical analysis; strain; shear strength; anisotropic materials; clays

1018017 81-08233

Application of numerical methods to design and construction control of soil structures in Japan

Drava, Y.

Numerical methods in geomechanics; Vol. 4, Additional contributions

Witke, W.(EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1473-1483

P., 1980

ISBN: 9061910447 6 REFS.

Subfile: B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., tables

Latitude: N300000; N450000 Longitude: E1470000; E1290000  
 Descriptors: \*Japan; \*soil mechanics; engineering geology; deformation; loading; foundations; Asia; embankments; structures; stress; numerical analysis; finite element analysis; statistical methods; settlement; failure; excavations

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018016 81 08252

**Nonlinear effects in dynamic soil structure interaction**

Knessef, J. M.; Scaletti, H.  
Univ. Texas, Austin, TX, USA

**Numerical methods in geomechanics; Vol. 4, Additional contributions**

Witke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1457-1470  
P., 1980

ISBN 9061910447 13 REFS.

Subfile B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

illus.

Descriptors: \*soil mechanics; \*foundations; \*experimental studies; structures; \*elastic materials; stress; finite element analysis; statistical methods, mathematical models; numerical analysis; strain; cyclic loading; shear modulus; elastic constants; Poisson's ratio; acceleration; seismic methods; geophysical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018014 81 08060

**Load deformation behaviour of foundations near slopes**

Baner, G. F.; Selvadurai, A. P. S.; Nicholas, T.  
Carleton Univ., Civ. Eng. Dep., Ottawa, Ont., CAN

**Numerical methods in geomechanics; Vol. 4, Additional contributions**

Witke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1441-1447  
P., 1980

ISBN 9061910447 11 REFS.

Subfile B

Country of Publ: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

illus., table

Descriptors: \*soil mechanics; \*foundations; \*slope stability studies; granular materials; construction; experimental bearing capacity; materials, properties; footings; settlement; analysis, statistical methods; numerical analysis; triaxial tests; stress; strain; failure; deformation; loading

1018013 81-08081

**Evaluation of the extent of movement of a sliding mass**

Choudhury, R. N.

**Numerical methods in geomechanics; Vol. 4, Additional contributions**

Witke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1433-1440  
P., 1980

ISBN: 9061910447 6 REFS.

Subfile: B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

Descriptors: \*slope stability; \*soil mechanics; excavations; site exploration; circular failure; testing; mass movements; stress; strain; deformation; numerical analysis; finite element analysis; statistical methods; pore pressure; loading

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018010 81-0805G

**Stability and settlement of embankments on soft Bangkok clay**  
Balasubramanian, A S.; Sivandran, C.; Ho, Y. M.

**Numerical methods in geomechanics; Vol. 4, Additional contributions**

Wittke, W.(EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1373-1411  
P., 1980

ISBN 9061910447 54 REFS.

Subfile B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus, tables

Descriptors: slope stability; soil mechanics; embankments; theoretical studies; circular failure; clays; triaxial tests; deformation; compressibility; finite element analysis; statistical methods; stress; strain; soft clays; plasticity; numerical analysis; shear strength; settlement; consolidation; statistical analysis; Thailand; Asia

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018008 81-08284

**A finite element simulation on the failure of brittle rocks**  
Szu-Ching Wang; Jun Liu

**Numerical methods in geomechanics; Vol. 4, Additional contributions**

Wittke, W.(EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1357-1362  
P., 1980

ISBN 9061910447 10 REFS.

Subfile B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: rock mechanics; deformation; failure; theoretical studies; microfractures; fracture strength; stress; strain; loading; numerical analysis; finite element analysis; statistical methods; uniaxial tests

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018005 81-08136

**A comparison of some constitutive laws for soils under radially symmetric loading and unloading**  
Guderus, G.

**Numerical methods in geomechanics; Vol. 4, Additional contributions**

Wittke, W.(EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1309-1323  
P., 1980

ISBN 9061910447 11 REFS.

Subfile B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: soil mechanics; deformation; consolidation; stress; strain; elasticity; loading; numerical analysis; triaxial tests; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018004 81-08318  
**Primary and secondary plane strain consolidation problems by the finite element method**  
 Yuan, C. H.; Mao, Y

**Numerical methods in geomechanics; Vol. 4, Additional contributions**  
 Wittke, W.(EDITOR)  
 Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
 Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1293-1306 p., 1980  
 ISBN: 9061910447 11 REFS.  
 Subfile B  
 Country of Pub.: International  
 Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*soil mechanics; \*deformation; settlement; theoretical studies; consolidation; compressibility; finite element analysis; statistical methods; pore pressure; elasticity; stress; strain; numerical analysis  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018003 81-08079  
**On the numerical solution of certain initial value problems**  
 Ching, Y. K.; Tham, L. G.

**Numerical methods in geomechanics; Vol. 4, Additional contributions**  
 Wittke, W.(EDITOR)  
 Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
 Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1283-1292 p., 1980  
 ISBN: 9061910447 11 REFS.  
 Subfile B  
 Country of Pub.: International  
 Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*rock mechanics; \*theoretical studies; finite element analysis; statistical methods; numerical analysis  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018002 81-08319  
**On the application of an interpolation matrix for**

1018005 81-08258  
**Analysis of consolidation of viscoelastic soils**  
 Sandhu, R. S.; Liu, H.  
 Ohio State Univ., Columbus, Ohio, USA; Goodyear Res., USA

**Numerical methods in geomechanics; Vol. 4, Additional contributions**  
 Wittke, W.(EDITOR)  
 Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
 Int. Conf. Numer. Methods Geomech., [Proc.] 3, 1255-1263 p., 1980  
 ISBN: 9061910447 29 REFS.  
 Subfile B  
 Country of Pub.: International  
 Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*soil mechanics; \*deformation; settlement; field studies; consolidation; viscoelasticity; finite element analysis; statistical methods; pore pressure; applications; numerical analysis  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**computation of stresses in finite elements**  
 Yuanxun Fan; Sijing Wang

**Analysis of consolidation of viscoelastic soils**  
 Sandhu, R. S.; Liu, H.  
 Ohio State Univ., Columbus, Ohio, USA; Goodyear Res., USA

**computation of stresses in finite elements**  
 Yuanxun Fan; Sijing Wang

1017999 81-08030  
**Numerical methods in geomechanics: Vol. 4. Additional contributions**  
Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979  
Int. Conf. Numer. Methods Geomech., [Proc.] 3. 295p., 1980  
ISBN: 9061910447  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: MONOGRAPHIC  
Languages: English  
Note: Individual papers are cited separately. (illus.)  
Descriptors: \*symposia; \*rock mechanics; \*soil mechanics; engineering geology; settlement; deformation; consolidation; elastic materials; numerical analysis; statistical analysis; slope stability; foundations; loading; failure; mathematical models; embankments; dam excavations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1016811 81-03863  
**Finite element simulation of Wilmington oil field subsidence; II, Nonlinear modelling**  
Kosloff, D.; Scott, R. F.; Scranton, J.  
Calif. Inst. Technol. Dep. Eng., Pasadena, Calif., USA; Long Beach City Dep. Oil Prop., USA  
Tectonophysics 70: 1-2. 159-183p., 1980  
CODEN: TCTOAM ISSN: 0040-1951  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; Bibliographic Level: ANALYTIC  
Languages: English  
Latitude: N333500; Longitude: W1180000  
Descriptors: \*California; engineering geology; land subsidence; Los Angeles County; United States; Southern California; Wilmington oil field; Long Beach; mathematical models; elasticity; plasticity; nonlinear models; theoretical studies; finite element analysis; statistical methods; automatic data processing; rheology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1016488 81-03705  
**Probabilistic partial safety factor design techniques for undrained soil stability problems**  
D'Andrea, R. A.  
Cornell Univ., Ithaca, N.Y., USA  
207p., 1980  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: \*soil mechanics; theoretical studies; stability; failure; probability  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1017575 81-08218  
**The mechanisms of ground surface subsidence above compacting multiphase reservoirs and their analysis by the finite element method**  
Moran, K.; Lewis, R. W.; White, I. R.  
Appl. Math. Model. 4: 3. 217-224p., 1980  
CODFN: AHMDL ISSN 0307-904X 26 REFS.  
Subfile: B  
Country of Publ.: United Kingdom  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Latitude: N510000; Longitude: E0080000; W0020000  
Descriptors: engineering geology; \*North Sea; petroleum engineering; models; mathematical methods; stress; subsidence; finite element analysis; statistical methods; Atlantic Ocean; Forties field; oil and gas fields  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1016996 81-03776  
**O metodo de permeabilidade variavel na analise por elementos finitos dos escoamentos em meios porosos**  
The variable permeability method in finite element analysis of seepage in porous media  
Correia, R.  
Geotecnica (Soc. Port. Geotecnica) 27. 95 107p., 1979  
CODFN: GEOTDM 7 REFS.

1905

DIALOG File89: GEOREF - 81-87/Sep (Copr. American Geological Institute) (Item 358 of 1356) User 5208 2sep82

1979

Neft' Gaz (Izv. Vyssh. Uchebn. Zaved) 12. 11-14p.

CODEN: IUNAZ ISSN: 0445-0109 5 REFS.

Subfile: B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Russian

illus.: tables  
Descriptors: sedimentary rocks; rock mechanics; properties; materials; physical properties; mechanical properties; strength; classification; statistical analysis; materials, properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1015337 81-04790

Metodika vydeleniya produktivnykh kolektorov i nekollektorov dlya mestozhdeniy, razrabatyvayemykh s vrutrikoturnym zavodniym  
Recognizing productive reservoirs and non-reservoirs for fields developed with contour flooding

Gattenberger, V. P.; Lutkov, V. A. 1980  
Geol. Nefti Gaza 3. 28-32p.

CODEN: GENGAS ISSN: 0016-7894 4 REFS.

Subfile: B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: Russian  
illus.: table

Descriptors: engineering geology; petroleum; petroleum engineering; exploration; secondary recovery; possibilities; reservoir rocks; statistical analysis  
Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

1016010 81-03715

Engineering soils mapping from multispectral remote sensing data using computer-assisted analysis

Woodring, S. M.  
Purdue Univ., West Lafayette, Indiana, USA  
unknown p. 1973

Subfile: B

Degree Level: Master's

Country of Publ.: United States

Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Languages: English  
Latitude: N393000; Longitude: W0953000  
Descriptors: Kansas; soils; automatic data processing; soil mechanics; geophysical surveys; surveys; engineering geology; materials; properties; remote sensing; soil maps; Jefferson County; United States; classification; applications; maps; multispectral analysis; methods; programs; cluster analysis; statistical methods; statistical analysis; cartography  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1015925 81-03730

Probabilistic seismic stability analysis: a case study

Athanasios, Grivas, D.  
Pensacola Polytech. Inst., Dep. Civ. Eng., Troy, N. Y., USA  
Can. Geotech. J. 17. 3. 352-360p. 1980

CODEN: CQJDAH ISSN: 0008 3674 11 REFS.

Subfile: B

Country of Publ.: Canada

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
Summary Languages: French

illus.: tables, sect  
Latitude: N420000; Longitude: W0730000  
Descriptors: New York; automatic data processing; engineering geology; slope stability; earthquakes; United States; Slingerlands; failure probability; probability; epicenters; models; safety factors; Hudson-Champlain Lowland; seismicity; seismic risk; 1568-1975; magnitude; static loading; mathematical models; errors; effects; land slides; geologic hazards; Monte Carlo analysis; Albany County; Snake Hill Formation; Middle Ordovician; Ordovician; case studies; Albany clay; Albany Lake; Pleistocene; Quaternary; Cenozoic; Appalachian Plateau  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1015666 81-03720

K voprosu klassifikatsii gornykh porod na osnove fiziko-mekhanicheskikh svoystv  
The classification of rocks using physico-mechanical properties  
Akhayev, F. Y.; Akhayev, S. G.

1015305 81-03691

**Rock physics characterization of Conway Granite from a DOE borehole, Conway, New Hampshire**

Warren, N.  
Univ. Calif., Inst. Geophys. and Planet. Sci., Los Angeles, Calif., USA  
Los Alamos Sci. Lab., [Rep.] LA-8102 MS, 51p., 1979  
CODEN: LASLCA  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; REPORT; Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: NIS, Springfield, Va., United States  
illus., tables  
Descriptors: \*New Hampshire; \*rock mechanics; \*igneous rocks; \*engineering geology; materials; properties; granites; granite; composition; Conway Granite; White Mountain Plutonic-Volcanic Series; United States; boreholes; granite-granodiorite family; ultrastructure; lamphyre; lamphyre and carbonate family; dikes; intrusions; microcracks; elastic properties; drilling; effects; grain size; petrology; materials; properties; statistical analysis; mineral composition; petrography; Osinee Mountains  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1014728 81-02436

**Flow law of wet quartzite in the alpha-quartz field**

Koch, P. S.; Christie, J. M.; George, R. P.  
Univ. Calif., Dep. Earth and Space Sci., Los Angeles, Calif., USA; Exxon Prod. Res. Co., USA  
American Geophysical Union: 1980 Spring annual meeting, Toronto, Ont., Canada, May 22-27, 1980  
Eos (Am. Geophys. Union, Trans.) 61: 17, 376p., 1980  
CODEN: EOSTAU ISSN: 0096-3941  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION; Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*deformation; \*rock mechanics; \*experimental studies; flow; quartzite; metamorphic rocks; hydration; temperature; strain; stress; dehydration; theoretical studies; least-squares analysis; statistical methods; quartz; silica minerals; framework silicates; silicates; alpha quartz  
Section Headings: 17 (GEOPHYSICS, GENERAL)

1014719 81-02459

**Constitutive model for the low temperature creep of polycrystalline salt**

Munson, D. E.  
Sandia Lab., Albuquerque, N.M., USA  
American Geophysical Union: 1980 spring annual meeting, Toronto, Ont., Canada, May 22-27, 1980  
Eos (Am. Geophys. Union, Trans.) 61: 17, 375p., 1980  
CODEN: EOSTAU ISSN: 0096-3941  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION; Bibliographic Level: ANALYTIC

Languages: English  
Descriptors: \*deformation; \*rock mechanics; \*salt tectonics; theoretical studies; mechanism; creep; salt; halite; halides; temperature; low temperature; mathematical models; models; polycrystalline materials; waste disposal; radioactive waste; stress; strain; finite element analysis; statistical methods  
Section Headings: 17 (GEOPHYSICS, GENERAL)

1013800 81-03813

**Rock mechanics as applied to mining**

Gowd, T. N.  
Geophys. Res. Bull. (Hyderabad) 17: 4, 147-161p., 1979  
CODEN: GRBUDH ISSN: 0378-6307 16 REFS.  
Subfile: B

Country of Publ.: India  
Doc Type: SERIAL; Bibliographic Level: ANALYTIC  
Languages: English  
illus., table, photos., diagrs.  
Latitude: N130000; N130000 Longitude: E0773000; E0773000  
Descriptors: \*India; \*rock mechanics; engineering geology; materials; properties; physical properties; mining geology; laboratory studies; Kolar Gold Fields; Asia; triaxial tests; finite element analysis; statistical methods; stress meters; extensometers; rock bursts; failure; materials; properties; compressive strength; dilatancy; Young's modulus; elastic constants; strain; quantitative methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1013750 81-03806

An approach to estimation of leakage from a karstic limestone reservoir  
Gangonadzhay, S.

Symposium; Engineering geological problems in hydrotechnical construction--Problemes de geologie del'ingenieur dans la construction hydrotechnique

Wolters, R. (EDITOR)  
Symposium; Engineering geological problems in hydrotechnical construction, Tiflis, Union of Soviet Socialist Republics, Sept. 12-19, 1979

Int. Assoc. Eng. Geol., Bull., 20, 189-191p., 1979

CODEN: BIEGB6 ISSN: 0074-1612

Subfile: B

Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English Summary Languages: French  
Descriptors: \*India; \*rock mechanics; \*ground water; engineering geology; methods; surveys; \*reservoirs; statistical methods; Asia; Kopilli Reservoir; Kopilli Dam; seepage; karst; limestone; carbonate rocks; mathematical methods; permeability; tritium; tracers; water balance; hydrogeology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1013745 81-03807

Probabilistic approach to the study of jointing in the rock masses

Gaziev, E. G.; Tiden, E. N.

Symposium; Engineering geological problems in hydrotechnical construction--Problemes de geologie del'ingenieur dans la construction hydrotechnique

Wolters, R. (EDITOR)  
Symposium; Engineering geological problems in hydrotechnical construction, Tiflis, Union of Soviet Socialist Republics, Sept. 12-19, 1979

Int. Assoc. Eng. Geol., Bull., 20, 178-181p., 1979

CODEN: BIEGB6 ISSN: 0074-1612 8 REFS.

Subfile: B

Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English Summary Languages: French  
Descriptors: \*rock mechanics; \*fractures; \*failure; style; mathematical methods; joints; methods; statistical analysis; probabilistic method; Gaziyev, E. G.  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1013737 81-03982

Deformational stress state of mountain slopes and its change when creating huge reservoirs

Stepanov, V. V.

Symposium; Engineering geological problems in hydrotechnical construction--Problemes de geologie del'ingenieur dans la construction hydrotechnique

Wolters, R. (EDITOR)  
Symposium; Engineering geological problems in hydrotechnical construction, Tiflis, Union of Soviet Socialist Republics, Sept. 12-19, 1979

Int. Assoc. Eng. Geol., Bull., 20, 147-149p., 1979

CODEN: BIEGB6 ISSN: 0074-1612 6 REFS

Subfile: B

Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English Summary Languages: French  
Descriptors: \*USSR; \*rock mechanics; engineering geology; slope stability; reservoirs; applications; Naryn River; Foclogul Reservoir; deformation; rockslides; mathematical methods; elastic theory; finite element analysis; statistical methods; mass movements; embankments; Kirghizia  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1013726 81-03922

Seismotectonics and dam construction; general report  
Oborn, L. E.

Symposium; Engineering geological problems in hydrotechnical construction--Problemes de geologie del'ingenieur dans la construction hydrotechnique

Wolters, R. (EDITOR)  
Symposium; Engineering geological problems in hydrotechnical construction, Tiflis, Union of Soviet Socialist Republics, Sept. 12-19, 1979

Int. Assoc. Eng. Geol., Bull., 20, 94-105p., 1979  
CODEN: BIEG86 ISSN: 0074-1612 100 REFS.

Subfile B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
illus.: geol. sect., block diags.  
Descriptors: \*dams; geologic hazards; \*earthquakes; \*rock mechanics; \*reservoirs; \*soil mechanics; \*seismology; design; applications; seismic risk; effects; foundations; genesis; seismotectonics; seismicity; faults; fault zones; folds; review; statistical methods; ground motion; site exploration; prediction  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1013710 81-03736

Geomechanical characteristics of a granite body at a dam site  
Barrocu, G.; Manca, P. P.

Symposium; Engineering geological problems in hydrotechnical construction--Problemes de geologie del'ingenieur dans la construction hydrotechnique

Wolters, R. (EDITOR)  
Symposium; Engineering geological problems in hydrotechnical construction, Tiflis, Union of Soviet Socialist Republics, Sept. 12-19, 1979

Int. Assoc. Eng. Geol., Bull., 20, 32-35p., 1979  
CODEN: BIEG86 ISSN: 0074-1612 7 REFS.

Subfile B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
block diag., geol. sect., tables  
Latitude: N404000; N404000 Longitude: E0082000; E0082000  
Descriptors: \*Sardinia; \*rock mechanics; engineering geology; materials; properties; dams; granite; Italy; Europe; granite-granodiorite family; materials; properties; factor analysis; statistical methods; fractures; permeability; Rio Pagghiolu; Tempio Pausanila; Sassari; models; deformation; tectonics; dikes; intrusions  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1013702 81-03924

Engineering geological problems related to the study, design and construction of dam foundations; general report  
Oliveira, R.

Symposium; Engineering geological problems in hydrotechnical construction--Problemes de geologie del'ingenieur dans la construction hydrotechnique

Wolters, R. (EDITOR)  
Symposium; Engineering geological problems in hydrotechnical construction, Tiflis, Union of Soviet Socialist Republics, Sept. 12-19, 1979

Int. Assoc. Eng. Geol., Bull., 20, 4-7p., 1979  
CODEN: BIEG86 ISSN: 0074-1612 9 REFS.

Subfile B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English Summary Languages: English  
table  
Descriptors: \*dams; \*foundations; design; statistical analysis; engineering geology; methods; rock mechanics; review  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

DIALOG FILE89: GEOREF - 61-82/Sep (Copr. American Geological Institute) (Item 372 of 1356) User 5208 2sep82

Country of Publ.: Canada  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., tables, geol. sects.  
 Latitude: N535000; W1135000 Longitude: W1135000; W1135000  
 Descriptors: Alberta; soil mechanics; rock mechanics; engineering geology; deformation; tunnels; till; shale; Canada; Whitemud Creek tunnel; Edmonton; clastic rocks; Pleistocene; Horse Canyon Formation; Cretaaceous; clastic sediments; physical properties; Pleistocene; Mesozoic; sewers; physical properties; vertical movements; Cenozoic; unconsolidated materials; Quaternary; finite element analysis; statistical methods; ground motion  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1012900 81-02394

Spectral reflectance and discrimination of plutonic rocks in the 0.45- to 2.45- $\mu$ m region

Blom, R. G.; Abrams, M. J.; Adams, H. G.  
 Calif. State Univ., Dep. Geosci., Northridge, Calif., USA;  
 Jnt Propul. Lab., USA  
 J. Geophys. Res. 85: B5, 2638-2648p., 1980  
 CODEN: JGREAS ISSN: 0148-0227 21 REFS.

Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus., tables  
 Descriptors: igneous rocks; rock mechanics; remote sensing; plutonic rocks; properties; materials; interpretation; infrared spectra; reflectance; spectral reflectance; field studies; discriminant analysis; statistical methods; gabbro; gabbro family; granitic composition; ultramafic composition; classification; mineral composition; materials, properties; infrared methods  
 : geophysical methods  
 : Section Headings: 17 (GEOPHYSICS, GENERAL)

Country of Publ.: Canada  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Note Presented at the 31st Can. Geotech. Conf., Winnipeg, Alberta, Oct. 18-20, 1978. illus., geol. sect., block diag., table  
 Latitude: N433000 Longitude: W0790000; W0790000  
 Descriptors: Ontario; ground water; hydrology; engineering geology; surveys; foundations; Canada; excavations; drawdown; soils; slope stability; drawdown response; levels; Bowmanville; nuclear power plant; water table; till; clastic sediments; Darlington; shorelines; Lake Ontario; Great Lakes; water levels; seepage; sand; finite element analysis; statistical methods; aquifers  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1012919 81-03869

Groundwater regime associated with slope stability in Champlain clay deposits

Lafleur, J.; Lefebvre, G.  
 Univ. Sherbrooke, Dep. Civ. Eng., Sherbrooke, Que., CAN  
 Can. Geotech. J. 17: 1, 44-53p., 1980  
 CODEN: CGJDAH ISSN: 0008-3674 9 REFS.

Subfile: B  
 Country of Publ.: Canada

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English Summary Languages: French

illus., geol. sect.  
 Latitude: N450000 Longitude: W0700000; W0700000  
 Descriptors: Quebec; soil mechanics; engineering geology; case studies; slope stability; Clays; Canada; Champlain Clay; ground water; finite element analysis; statistical methods; permeability; hydraulic head; flow regime; Mull; Geany Creek; Saint Urban; Saint Ambrose; Nicolet; Nicolet River; controls  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1012917 81-03993

Field measurements in two tunnels in Edmonton, Alberta

Thomson, S.; El-Nahas, F.  
 Univ. Alberta, Dep. Civ. Eng., Edmonton, Alberta, CAN  
 Can. Geotech. J. 17: 1, 20-33p., 1980  
 CODEN: CGJDAH ISSN: 0008-3674 18 REFS.

Subfile: B

Country of Publ.: Canada  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French

illus., geol. sect.  
 Latitude: N450000 Longitude: W0700000; W0700000  
 Descriptors: Quebec; soil mechanics; engineering geology; case studies; slope stability; Clays; Canada; Champlain Clay; ground water; finite element analysis; statistical methods; permeability; hydraulic head; flow regime; Mull; Geany Creek; Saint Urban; Saint Ambrose; Nicolet; Nicolet River; controls  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1012917 81-03993

Field measurements in two tunnels in Edmonton, Alberta

Thomson, S.; El-Nahas, F.  
 Univ. Alberta, Dep. Civ. Eng., Edmonton, Alberta, CAN  
 Can. Geotech. J. 17: 1, 20-33p., 1980  
 CODEN: CGJDAH ISSN: 0008-3674 18 REFS.

Subfile: B

1012891 81-02432

**In-plane propagation of shear microcracks in brittle rocks under triaxial compression**

Jannach, W.; Guex, L. H.  
 J. Geophys. Res. 85, B5, 2543-2553p., 1980  
 CODEN JGREA2 ISSN: 0148-0227 34 REFS.  
 Subfile B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English

Descriptors: rock mechanics; \*deformation; \*fractures; theoretical studies; genesis; shear; Westerly Granite; mathematical models; models; cracks; microcracks; propagation; brittle materials; triaxial tests; compression; finite element analysis; statistical methods; mechanics; separation; bubbles; granite; granite-granodiorite family; failure  
 Section Headings: 17 (GEOPHYSICS, GENERAL)

1012849 81-03731

**The evaluation of seismic risk in northern Canada and applications to pipeline response**

Atkinson, G.; Novak, M.; Davenport, A. G.  
 Univ. West. Ont. Fac. Eng. Sci., London, Ont., CAN  
 American Geophysical Union, 1980 spring annual meeting, Toronto, Ont., Canada, May 22-27, 1980  
 Eos (Am. Geophys. Union, Trans.) 61: 17, 306p., 1980  
 CODEN: EOSTAU ISSN: 0096-3941  
 Subfile B  
 Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N650000; N800000 Longitude: W0600000; W1400000  
 Descriptors: \*Canada; \*seismology; engineering geology; seismicity; earthquakes; seismic risk; geologic hazards; ground motion; Arctic region; pipelines; design; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1011974 80-51169

**System interaction of expansive soils with light foundations**

Mathewson, C. C.; Dobson, B. M.; Dyke, L. D.; Lytton, R. L.  
 Tex. A&M Univ., Dep. Geol., College Station, Tex., USA  
 McClelland Eng., USA  
 Assoc. Eng. Geol., Bull. 17: 2, 55-94p., 1980  
 CODEN: ENGEA9 ISSN: 0004-5691 10 REFS.  
 Subfile B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
 Title: tables, sketch maps  
 Latitude: N290000; N314500 Longitude: W0940000; W0990000  
 Descriptors: \*Texas; \*soil mechanics; engineering geology; case studies; foundations; expansive materials; Bexar County; McLennan County; Brazos County; Jefferson County; United States; geologic hazards; San Antonio; College Station; Waco; Beaumont; Gulf Coastal Plain; North America; statistical analysis; damage; site exploration; creep  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1011638 80-51059

**Rock load on the support structures of two large underground hydroelectric power stations**

Dolcetta, M.; Capozza, F.; Martinetti, S.

Berichte: Internationales Symposium fuer Untertagebau--Compt-e-rendus; Symposium International de la construction de cavites souterraines--Proceedings; International symposium on underground openings

Internationales Symposium fuer Untertagebau--Symposium International de la construction de cavites souterraines--International symposium on underground openings, Lucerne, Switzerland, Sept. 11-14, 1972  
 Publ.: A. A. Balkema/Schweiz. Ges. Boden-Felsmech. 405-446p., 1979  
 Ed. 2 55 REFS.  
 Subfile B

Country of Publ.: Switzerland  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English Summary Languages: German  
 Title: tables  
 Latitude: N363000; N473000 Longitude: E0190000; E0063000  
 Descriptors: \*rock mechanics; Italy; excavations; engineering geology; rock pressure; underground installations; underground space; Europe; Lake Delio; San Fiorano; stress; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1011632 80-51250  
**Analyse du comportement elastoplastique des cavites de stockage de gaz en couche de sel par la methode des elements finis**  
 Analysis of the elastoplastic behavior of gas storage cavities in salt deposits by finite-element method  
 Stromsdorfer, P. M.

**Berichte; Internationales Symposium fuer Untertagbau--Compt-e-rendus; Symposium international de la construction de cavites souterraines--Proceedings; International symposium on underground openings**  
 Grob, H. (EDITOR); Kovari, K. (EDITOR)  
 Internationales Symposium fuer Untertagbau--Symposium international de la construction de cavites souterraines--International symposium on underground openings, Lucerne, Switzerland, Sept. 11-14, 1972.  
 Publ. A. A. BalkemaSchweiz. Ges. Boden-felsmech. 336-350p., 1979  
 Ed. 2 7 REFS  
 Subfile B  
 Country of Publ.: Switzerland  
 Doc Type BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: French Summary Languages: English  
 illus., sketch maps  
 Descriptors: +france; rock mechanics; engineering geology; materials; properties; underground installations; finite element analysis; Europe; Lyon; Tersanne; natural gas; storage; statistical methods; stress; salt  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1011631 80-51249

**On the application of a numerical visco-plastic model to rock mechanics problems**  
 Stado, K. G.; Zienkiewicz, O. C.; Corneau, I. C.

**Berichte; Internationales Symposium fuer Untertagbau--Compt-e-rendus; Symposium international de la construction de cavites souterraines--Proceedings; International symposium on underground openings**  
 Grob, H. (EDITOR); Kovari, K. (EDITOR)  
 Internationales Symposium fuer Untertagbau--Symposium international de la construction de cavites souterraines--International symposium on underground openings, Lucerne, Switzerland, Sept. 11-14, 1972.  
 Publ. A. A. BalkemaSchweiz. Ges. Boden-felsmech. 327-370p., 1979  
 Ed. 2 9 REFS  
 Subfile B  
 Country of Publ.: Switzerland  
 Doc Type BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: German

1011627 80-51001

**Milchbuck-Tunnel; Dimensionierung der Tunnelauskleidung**  
 Bebi, P.  
 Elektro-Watt Ingenieurunternehm. AG, Zurich, CHE

**Berichte; Internationales Symposium fuer Untertagbau--Compt-e-rendus; Symposium international de la construction de cavites souterraines--Proceedings; International symposium on underground openings**  
 Grob, H. (EDITOR); Kovari, K. (EDITOR)  
 Internationales Symposium fuer Untertagbau--Symposium international de la construction de cavites souterraines--International symposium on underground openings, Lucerne, Switzerland, Sept. 11-14, 1972.  
 Publ. A. A. BalkemaSchweiz. Ges. Boden-felsmech. 279-289p., 1979  
 Ed. 2 9 REFS  
 Subfile B  
 Country of Publ.: Switzerland  
 Doc Type BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: French  
 Latitude: N471000; N474000 Longitude: E0090000; E0092000  
 Descriptors: +Switzerland; +soil mechanics; +rock mechanics; engineering geology; theoretical studies; tunnels; finite element analysis; design; linings; Milchbuck Tunnel; Europe; Zurich; stress; sandstone; clastic rocks; marl; carbonate rocks; moraines; molasse; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1011625 80-50996

**Analysis of stress around underground openings reinforced with rock bolts**

Barla, G. ; Craverio, M.

**Berichte; Internationales Symposium fuer Untertagbau--Compte-rendus; Symposium international de la construction de cavites souterraines--Proceedings; International symposium on underground openings**

Grab, H.(EDITOR); Kovari, K.(EDITOR)  
Internationales Symposium fuer Untertagbau--Symposium international de la construction de cavites souterraines--International symposium on underground openings. Lucerne, Switzerland, Sept. 11-14, 1972  
Publ.: A. A. BalkemaSchweiz. Ges. Boden-Felsmech. 252-269p., 1979  
Ed. 2 9 REFS.

Subfile: B  
Country of Publ.: Switzerland  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus., tables

Descriptors: rock mechanics; tunnels; theoretical studies; stress; finite element analysis; statistical methods; rock bolts; stability; mathematical models;

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1011613 80-50990

**Influence de saignees sur la repartition des contraintes autour d'une galerie**  
**Influence of radial slits on the stress distribution around a tunnel**

Aufaure, M.; Bozetto, P.; Duffaut, P.

**Berichte; Internationales Symposium fuer Untertagbau--Compte-rendus; Symposium international de la construction de cavites souterraines--Proceedings; International symposium on underground openings**

Grab, H.(EDITOR); Kovari, K.(EDITOR)  
Internationales Symposium fuer Untertagbau--Symposium international de la construction de cavites souterraines--International symposium on underground openings. Lucerne, Switzerland, Sept. 11-14, 1972  
Publ.: A. A. BalkemaSchweiz. Ges. Boden-Felsmech. 170-177p., 1979  
Ed. 2 7 REFS.

Subfile: B  
Country of Publ.: Switzerland  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: French Summary Languages: English  
illus

Descriptors: tunnels; rock mechanics; theoretical studies; stress; finite element analysis; statistical methods; granite; granite-granodiorite family; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1010256 80-51186

**An experimental programme to define the yield function for sand**

Moroto, N.  
Soils Found.(Tokyo) 20: 1, 91-92p., 1980  
CODEN: SOIFBE ISSN: 0038-0806 2 REFS.  
Subfile: B

Country of Publ.: Japan  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

Descriptors: deformations; soil mechanics; experimental studies; foundations; yield strength; sand; yield function; clastic sediments; compression; triaxial tests; finite element analysis; statistical methods; analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1010255 80-51036

**Parametric elastoplastic analysis of clay fills**

Cavounidis, S.  
Soils Found.(Tokyo) 20: 1, 83-89p., 1980  
CODEN: SOIFBE ISSN: 0038-0806 8 REFS.  
Subfile: B

Country of Publ.: Japan  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., table

Descriptors: soil mechanics; deformation; foundations; theoretical studies; stress; plasticity; elastic properties; clays; analysis; finite element analysis; statistical methods; embankments; displacements; experimental studies; models; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1010252 80-51171

**A design method of deep excavation in cohesive soil based on the reliability theory**

Matsuo, M.; Kawamura, K.  
Soils Found (Tokyo) 20: 1, 61-75p., 1980  
CODEN: SOIFBE ISSN: 0038-0806 12 REFS.

Subfile: B

Country of Pub.: Japan

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus.: tables

Descriptors: \*soil mechanics ; theoretical studies ;  
cohesive materials; excavations; construction; statistical  
analysis; design; analysis; economics

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1010251 80-51199

**A stress-strain relationship of normally consolidated cohesive soil under general stress condition**

Ohmaki, S.  
Soils Found (Tokyo) 20: 1, 29-43p., 1980  
CODEN: SOIFBE ISSN: 0038-0806 35 REFS.

Subfile: B

Country of Pub.: Japan

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus.: table

Descriptors: \*deformation; \*soil mechanics ; experimental  
studies; materials; properties ; clays; soils; stress;  
strain; elasto-plasticity; models; mathematical models;  
failure; shear strength; cohesive materials; finite element  
analysis; statistical methods; triaxial tests

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1010026 80-51041

**Plasticity approach to landslide problems**

Chen, W. F.; Koh, S. L.  
Purdue Univ., Sch. Civ. Eng., West Lafayette, Indiana, USA

**Mechanics of landslides and slope stability**

Koh, S. L. (EDITOR)  
Society of Engineering Science, 15th annual meeting,  
Mechanics of landslides and slope stability, Gainesville,  
Fla., United States, Dec. 5-6, 1978

Eng. Geol. 16: 1-2, 125-133p., 1980

CODEN: EGGDAD ISSN: 0013-7952 10 REFS.

Subfile: B

Country of Pub.: International

Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*slope stability; \*soil mechanics; \*deformation  
; landslides; theoretical studies ; mechanism; plasticity  
; mathematical models; models; automatic data processing;  
finite element analysis; statistical methods; earthquakes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1010020 80-51020

**Searching techniques in slope stability analysis**

Routrup, E.; Lovell, C. W.  
Purdue Univ., Sch. Civ. Eng., West Lafayette, Indiana, USA

**Mechanics of landslides and slope stability**

Koh, S. L. (EDITOR)  
Society of Engineering Science, 15th annual meeting,  
Mechanics of landslides and slope stability, Gainesville,  
Fla., United States, Dec. 5-6, 1978

Eng. Geol. 16: 1-2, 51-61p., 1980

CODEN: EGGDAD ISSN: 0013-7952 6 REFS.

Subfile: B

Country of Pub.: International

Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: \*slope stability; \*automatic data processing ;  
failure; engineering geology ; analysis; techniques ;  
statistical methods; computer programs; STAB; soil  
mechanics; graphic methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1010019 80-51265  
Probabilistic stability analysis of earth slopes  
Vannarcke, E. H. Dep. Civ. Eng., Cambridge, Mass., USA  
Illustration: Sweden; seismology; engineering geology; earthquakes; intensity; Europe; 1951-1976; magnitude; seismic risk; geologic hazards; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1009063 80-50054  
Experimental studies on the origin of low resistivity - low velocity layer beneath North China Plain and finite element analysis for its relationship to seismicity  
Loo Huanyen; Song Huishen; Gup Cainia  
International Union of Geodesy and Geophysics. 17th general assembly. ICG abstracts and timetable. Canberra, Australia. Dec. 3-15, 1979  
Int. Union Geod. Geophys., Gen. Assem., Abstr. 17, 3.18 P., 1979  
CODEN: ICABAX  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Latitude: N200000; N530000 Longitude: E1350000; E0740000  
Descriptor: seismology; China; rock mechanics; seismicity; materials; properties; tectonophysics; seismotectonics; earthquakes; igneous rocks; crust; Asia; North China Plain, magnetotelluric surveys; geophysical surveys; seismic anomalies; resistivity; electrical properties; laboratory studies; finite element analysis; statistical methods; theoretical studies; mechanism; macroearthquakes; p-T conditions; melting; intraplate tectonics; stress  
Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

1010010 80-50992  
A method for mapping seismic intensities applied to Sweden  
Bath, M.  
Tectonophysics 66: 4, T11-T18p., 1980  
CODEN: TCTOAM ISSN: 0040-1951 11 REFS.  
Subfile: B  
Country of Publ.: International Bibliographic Level: ANALYTIC  
Languages: English  
Note: Letter, illus., sketch map  
Descriptors: Sweden; seismology; maps; earthquakes; engineering geology; cartography; geologic hazards; intensity; seismicity maps; Europe; statistical methods; magnitude; graphic methods; automatic data processing; seismicity; seismic risk  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1009956 80-50991  
Intensity relations for Swedish earthquakes  
Bath, M.  
Tectonophysics 67: 1-2, 163-173p., 1980  
CODEN: TCTOAM ISSN: 0040-1951 19 REFS.  
Subfile: B  
Country of Publ.: International Bibliographic Level: ANALYTIC  
Languages: English

Mechanics of landslides and slope stability  
Koh, S. L. (EDITOR)  
Society of Engineering Science. 15th annual meeting. Mechanics of landslides and slope stability. Gainesville, Fla., United States. Dec. 5-6, 1978  
Eng. Geol. 16: 1-2, 29-50p., 1980  
CODEN: EGGDAD ISSN: 0013-7952 21 REFS.  
Subfile: B  
Country of Publ.: International Bibliographic Level: ANALYTIC  
Languages: English  
Illustration: slope stability; failure; analysis; probability; statistical methods; theoretical studies; three-dimensional models; equilibrium analysis; numerical analysis; shear strength; embankments; soil mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1010019 80-51265  
Probabilistic stability analysis of earth slopes  
Vannarcke, E. H. Dep. Civ. Eng., Cambridge, Mass., USA  
Illustration: Sweden; seismology; engineering geology; earthquakes; intensity; Europe; 1951-1976; magnitude; seismic risk; geologic hazards; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1009063 80-50054  
Experimental studies on the origin of low resistivity - low velocity layer beneath North China Plain and finite element analysis for its relationship to seismicity  
Loo Huanyen; Song Huishen; Gup Cainia  
International Union of Geodesy and Geophysics. 17th general assembly. ICG abstracts and timetable. Canberra, Australia. Dec. 3-15, 1979  
Int. Union Geod. Geophys., Gen. Assem., Abstr. 17, 3.18 P., 1979  
CODEN: ICABAX  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Latitude: N200000; N530000 Longitude: E1350000; E0740000  
Descriptor: seismology; China; rock mechanics; seismicity; materials; properties; tectonophysics; seismotectonics; earthquakes; igneous rocks; crust; Asia; North China Plain, magnetotelluric surveys; geophysical surveys; seismic anomalies; resistivity; electrical properties; laboratory studies; finite element analysis; statistical methods; theoretical studies; mechanism; macroearthquakes; p-T conditions; melting; intraplate tectonics; stress  
Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

1010010 80-50992  
A method for mapping seismic intensities applied to Sweden  
Bath, M.  
Tectonophysics 66: 4, T11-T18p., 1980  
CODEN: TCTOAM ISSN: 0040-1951 11 REFS.  
Subfile: B  
Country of Publ.: International Bibliographic Level: ANALYTIC  
Languages: English  
Note: Letter, illus., sketch map  
Descriptors: Sweden; seismology; maps; earthquakes; engineering geology; cartography; geologic hazards; intensity; seismicity maps; Europe; statistical methods; magnitude; graphic methods; automatic data processing; seismicity; seismic risk  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1009956 80-50991  
Intensity relations for Swedish earthquakes  
Bath, M.  
Tectonophysics 67: 1-2, 163-173p., 1980  
CODEN: TCTOAM ISSN: 0040-1951 19 REFS.  
Subfile: B  
Country of Publ.: International Bibliographic Level: ANALYTIC  
Languages: English

DIALOG File#9 - GEOREF - 61-82/Sep (Copr. American Geological Institute) (Item 395 of 1356) User 5208 2sep82

1008673 80-51252

**A study on core discing of rock**

Sugawara, K.; Kameoka, Y.; Saito, T.; Oka, Y.; Hiramatsu, Y.  
 J. Min. Metall. Inst. Jap. 94: 1089, 797-803p., 1978  
 ISSN: 0369-4194 8 REFS.

Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus.  
 Descriptors: \*rock mechanics; \*fractures; failure;  
 genesis; cores; loading; stress; tensile strength;  
 mechanism; finite element analysis; statistical methods;  
 deformation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1006370 80-45468

**Least squares calculation of horizontal stresses from more than three diametral deformations in vertical boreholes**

Duvall, W. I.; Aggson, J. R.  
 U. S. Bur. Mines. Rep. Invest. 8414, 11p., 1980  
 CODEN: XBMI46 ISSN: 0096-1922 7 REFS.

Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Descriptors: \*rock mechanics; materials; properties;  
 stress; materials; properties; in situ; design;  
 mathematical methods; equations; least-squares analysis;  
 statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1005946 80-46017

**Discontinuity models of problems in geomechanics**

Starfield, A. M. Advances in analysis of geotechnical  
 Symposium on Waterloo, Ont., Canada, Sept. 1976-Oct.  
 1977  
 SM Stud. 13, 221-230p., 1978  
 ISSN: 0318-3122 15 REFS.

Subfile: B  
 Country of Publ.: Canada  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*rock mechanics; deformation; tension;  
 engineering geology; automatic data processing; models;  
 stress; displacements; joints; fractures; finite element  
 analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1005905 80-46080

**Analysis of group pile foundation subjected to lateral loads by two-dimensional finite element method**

Wakita, E.  
 Tsuchi-to-Kiso 27: 9, 35-42p., 1979  
 8 REFS.

Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus.  
 Descriptors: \*foundations; piles; lateral loading;  
 two-dimensional models; models; finite element analysis;  
 statistical methods; plane strain; soil mechanics; loading;  
 three-dimensional models; new methods; group piles  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1005880 80-45809

**Settlement under circular loading for construction of tank foundation**

Jimno, K.; Ohira, A.; Saito, I.; Mae, K.  
 Tsuchi-to-Kiso 26: 2, 33-40p., 1978  
 4 REFS.

Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus.  
 Descriptors: \*foundations; soil mechanics; settlement;  
 loading; circular loading; strain; deformation; finite  
 element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1005760 80-45950

**Use of a computer model in the safety assessment of buried nuclear waste repositories at a hypothetical site in the Columbia Plateau basalts**

Petrie, G. M.  
 Battelle Pac. Northwest Lab., Richland, Wash., USA  
 The Geological Society of America, Cordilleran Section, 76th  
 annual meeting, Corvallis, Oreg., United States, March  
 19-21, 1980

Geol. Soc. Am., Abstr. Programs 12: 3, 146p., 1980  
 CODEN: GAAPBC ISSN: 0016-7592

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: Columbia Plateau; Longitude: W1150000; W1200000

; engineering geology; waste disposal; geologic hazards;

Columbia River Basalt; United States; radioactive waste;

storage; probability; simulation; mathematical models;

models; theoretical studies

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1005388 80-45858

**Finite element simulation of Wilmington oil field**

subfile: I, Linear modelling  
 Koaloff, D.; Scott, R. F.; Scranton, J.  
 Calif. Inst. Technol., Dep. Eng., Pasadena, Calif., USA;

Long Beach Dep. Oil Prop., USA

Tectonophysics 65: 3-4, 339-368p., 1980

CODEN: TCTDAM ISSN: 0040-1951 27 REFS.

Subfile: B

Country of Publ.: International

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

Latitude: N335000 Longitude: W1180000; W1183000

Descriptors: California; engineering geology; land

subfile: Los Angeles County; United States; Southern

California; Wilmington oil field; Long Beach; finite

element analysis; statistical methods; mathematical models;

models; simulation; numerical analysis; theoretical

studies; tectonics; subsidence; rheology; plasticity

Section Headings: 27 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1005288 80-45974

**Review of cases of damage related to dams**

Rouve, G.

Lectures of the Seminar: Failures of large dams, reasons and

**remedial measures**

Rouve, G.; Strack, B.; Idel, K. H.; Beckmann, J.; Hager, M.;

Bourcek, B.; Sowers, G. F.; Glig, B.

Failures of large dams: reasons and remedial measures,

Aachen, German Democratic Republic, Jan. 6-7, 1977

Publ. Inst. Found. Eng., Soil Mech., Rock Mech., Water Ways

Constr., RWTH (Univ.)

11-32p., 1977

12 REFS.

Subfile: B

Country of Publ.: Germany, Federal Republic of

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., sects., sketch maps

Descriptors: rock mechanics; dams; case studies;

construction; failure; engineering geology; design;

reservoirs; statistical analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1004994 80-45645

**Modelling heat transfer and rock deformation processes in geothermal systems**

Archambeau, C.; Holcomb, U.; Kassooy, D. R.; Rinehart, J. S.;

Zebib, A.  
 Univ. Colo., Boulder, Colo., USA

**Second workshop on geothermal reservoir engineering: summaries**

Kruger, P. (EDITOR); Ramey, W. J., Jr. (EDITOR)

Second workshop on geothermal reservoir engineering,

Stanford, Calif., United States, Dec. 1-3, 1976

Publ.: Stanford Univ.

263-267p., 1976

Subfile: B

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: rock mechanics; geothermal energy;

theoretical studies; production; geothermal processes;

geothermal systems; mathematical models; heat

transfer; deformation; Mesa Anomaly; porous media; fault

zones; fractures; convection; finite element analysis;

statistical methods; dilatancy

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1004933 80-45702

**Relationships between plasticity, natural moisture conditions and surface stability of some slope soils near Helmsley, North Yorkshire**  
Cooper, R

**Geographical approaches to fluvial processes**

Publ. A F (EDITOR)  
Publ. Geo Abstracts  
109 1960 1979  
ISBN 0860040276 2R REFS.  
Subfile B  
Country of Publ. United Kingdom  
Doc. Type BOOK Bibliographic Level: ANALYTIC  
Languages English  
illus. plates, tables, sketch map, geol. sect.  
Latitude N532600, E544000 Longitude E0001000; W0023000  
Descriptors: England; soil mechanics; engineering geology; materials; properties; slope stability; plasticity; Europe; Yorkshire; Helmsley; erosion; landslides; clays; clastic sediments; moisture; seasonal variations; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1004903 80-45543

**A relationship between productivity of gas wells and their locations with respect to lineaments: a statistical analysis**

Zirk, W F; Lahoria, S J  
W Va Univ. Dep. Stat. and Comput. Sci., Morgantown, W Va., USA  
36p. 1979  
7 REFS.  
Subfile B  
Doc. Type REPORT Bibliographic Level: MONOGRAPHIC  
Languages English  
Report No. MFIC/R 79/14  
Availability NIS, Springfield, Va., United States  
illus. tables  
Descriptors: natural gas; engineering geology; production; petroleum engineering; statistical analysis; lineaments; regression analysis; mathematical models; models; structural controls; reservoir rocks; subsurface geology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1001467 80-45829

**Seismic response analysis of composite ground treated by deep chemical mixing stabilization method, part 1. Analytical method**

Kawabata, T.; Niino, A.; Suzuki, Z.; Yamamizu, Y.; Matsui, Y.; Suzuki, Y.

Fifth Japan earthquake engineering symposium, Tokyo, Japan, Nov. 28-30, 1978  
Proc. Jap. Earthquake Eng. Symp., 5, 769-776p., 1978

10 REFS.  
Subfile: B  
Country of Publ.: Japan  
Doc. Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: Japanese Summary Languages: English  
illus.

Descriptors: earthquakes; effects; ground motion; Japan; Asia; engineering geology; finite element analysis; statistical methods; geophysical methods; soil mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1004377 80-45754

**Statistical analysis of earthquake ground motion with the effect of frequency-content correction**

Goto, H.; Kaneda, H.; Imanishi, N.; Washimoto, O.  
Fifth Japan earthquake engineering symposium, Tokyo, Japan, Nov. 28-30, 1978  
Proc. Jap. Earthquake Eng. Symp., 5, 49-57p., 1978  
7 REFS.

Subfile B  
Country of Publ.: Japan  
Doc. Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: Japanese Summary Languages: English  
illus.

Latitude N300000; N450000 Longitude E1470000; E1290000  
Descriptors: earthquakes; effects; ground motion; Japan; Asia; engineering geology; accelerograms  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1003811 80-45683

**Determination of earth pressures on sheet pile walls from measures of deflections and bending moments**

Chile, E O F  
 Delft. Lab. Groundmechanica. LGM Meded 20 2.4. 87-97p.  
 1979

5 REFS.  
 Subfile B  
 Country of Publ.: Netherlands  
 Doc Type: SERIAL Bibliographic Level ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: foundations; soil mechanics; piles; theoretical studies; mathematical models; finite element analysis; statistical methods; least squares analysis; earth pressure; structures  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1002789 80-46757

**Better exploration decisions with probability analysis**

Davis, J C  
 Kansas Geol. Surv., Lawrence, Kans., USA  
 U. S. Geol. Surv. 115. 6-8p. 1979  
 Subfile B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level ANALYTIC  
 Languages: English  
 Descriptors: mineral exploration; petroleum; methods; exploration; probability; engineering geology; petroleum engineering; geophysical surveys; models; analysis; automatic data processing  
 Section Headings: 25 (ECONOMIC GEOLOGY, GENERAL & MINING)

1002615 80-45503

**Probabilistic estimates of maximum seismic horizontal ground motion on rock in the Pacific Northwest and the adjacent outer continental shelf**

Parkins, D M; Thomas, P C; Hanson, S L; Zippy, J I  
 Alghemisson, S T  
 U. S. Geol. Surv., Open File Rep. 80-471. 40p. 1980  
 CDDEN YCROAG

Subfile B  
 Country of Publ.: United States  
 Doc Type: SERIAL REPORT Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: U. S. Geol. Surv., Open File Serv. Sect. Branch Distrib., Denver, Colo., United States  
 illus.  
 Latitude: N400000; Longitude: W1200000  
 Descriptors: Pacific Coast; Washington; Oregon; seismology; oceanography; engineering geology;

earthquakes; continental shelf; geologic hazards; seismic risk; United States; outer shelf; ground motion; probability; horizontal movements  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1002389 80-46795

**Notes on the application of the finite element method to mining research**

Scoble, M. J. (COMPILER)  
 Min. Dep. Mag., Univ. Nott., Dep. Min. Eng. 28. 57-67p.  
 1976

ISSN: 0307-9066 8 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: automatic data processing; mining geology; engineering geology; methods; mathematical models; statistical analysis; models; finite element analysis; statistical methods  
 Section Headings: 26 (ECONOMIC GEOLOGY, GENERAL & MINING)

1001410 80-40448

**Rock mechanics investigations into the directional stability of underground mine roadways in the Southern Coalfield of New South Wales**

Yeates, R. A.  
 Univ. of New South Wales, AUS  
 unknownp.  
 Subfile: B

Country of Publ.: Australia  
 Degree Level: Doctoral  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Latitude: S373000; Longitude: E1533000; E1410000  
 Descriptors: New South Wales; rock mechanics; mining geology; engineering geology; site exploration; technology; underground installations; mines; Australia; Southern Coalfield; coal fields; stability; roadways; orientation; stress; deformation; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1001409 80 40444

**Probabilistic analysis of stability and settlement of structures on soft Bangkok Clay**

Author: Chaiyaporn, C.  
 Action: Inst. of Technol., ITA  
 Unknown: 13-9  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Pub: Thailand  
 Doc Type: THESES Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilm  
 Latitude: N051500; Longitude: E1060000; E0963000  
 Call No: N051500; M030000  
 Descriptors: Thailand; soil mechanics; engineering geology; materials; properties; clays; Asia; materials; properties; Bangkok Clay; settlement; probability; factor analysis; statistical methods; stability; finite element analysis; failure; deformation; shear strength; compressibility.  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1001157 80 39530

**Note on measured values for the state of stress in the Earth's Crust**

Author: Jamison, D. R.; Cook, N. G. W.  
 Action: Berkeley Lab., Dep. Mater. Sci. and Miner. Eng., Berkeley, Calif., USA  
 J. Geophys. Res. 85: B4, 1833-1838p., 1980  
 CODEN: JGPPD5 ISSN: 0148-0227 30 REFS  
 Subfile: B  
 Country of Pub: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Illustr: Table  
 Descriptors: deformation; rock mechanics; crust; field studies; interpretation; stress; theoretical studies; in situ; statistical analysis; strain; plate tectonics  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

1000859 80-40804

**K voprosu o primeneni matematicheskogo modelirovaniya geologicheskikh poley pri krupnomasshtabnykh inzhenerno-geologicheskikh issledovaniyakh**  
**The use of mathematical models of geological fields during large-scale engineering geological studies**

Author: Shestakov, A. A.  
 Sovremennyye metody izucheniya fiziko-mekhanicheskikh svoystv gornyykh porod  
 Zbornik. A. P. (EDITOR); Bondarik, G. K. (EDITOR); Iverucalinskaya, Ye. N. (EDITOR); Tsareva, A. M. (EDITOR);

Author: Tsarev, P. V. (EDITOR); Mattis, T. I. (EDITOR)  
 Vses. Nauchno-Issled. Inst. Gidrogeol. Inzh. Geol., Tr., M. S. 107, 76-80p., 1976  
 ISSN: 0541-1025 4 REFS.

Subfile: B  
 Country of Pub: Union of Soviet Socialist Republics  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Russian  
 Illustr:  
 Descriptors: engineering geology; methods; mathematical models; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1000830 80-40493

**Postroyeniye karty opolznevoy aktivnosti na ETSVM**  
**Constructing a map of creep activity using computers**

Author: Bondarenko, A. A.; Kopylova, A. F.

Voprosy prognozirovaniya opolznevykh i erozionnykh protsessov  
 Siroko, A. I. (EDITOR); Kyunttsel', V. V. (EDITOR); Krupoderov, V. S. (EDITOR); Tarasova, G. I. (EDITOR)  
 Vses. Nauchno-Issled. Inst. Gidrogeol. Inzh. Geol., Tr., M. S. 119, 33-37p., 1978  
 ISSN: 0541-1025 3 REFS.  
 Subfile: B  
 Country of Pub: Union of Soviet Socialist Republics  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Russian

Descriptors: slope stability; automatic data processing; maps; erosion; engineering geology; cartography; creep programs; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1000131 80-40436

**The Tashkent-California system of earthquake spectra**

Razuvayko, Yu. V.; Seymurzova, S. S.  
 Phys. Solid Earth (Engl. Ed.) 14, 10, 722-734p., 1979  
 CHEN INSEPRG ISSN 0001-4354 28 REFS.  
 Subfile B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., sketch maps  
 Latitude: N323000 Longitude: W1141500; W1243000  
 Descriptors: California; \*seismology; \*USSR; earthquakes;  
 engineering geology; geologic hazards; spectral analysis;  
 United States; Tashkent; elastic waves; probability;  
 seismic risk; zoning; seismicity; mathematical models;  
 models

Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

999827 80-40762

**Canadian methodologies of probabilistic seismic risk estimation/discussion and reply**

Lomnitz, C.; Weichert, D. H.; Milne, W. G.  
 Pac. Geosci. Cent., Sidney, B.C., CAN  
 Seismol. Soc. Am., Bull. 70: 3, 933, 935p., 1980  
 CODEN: BSSAAP ISSN: 0037-1106 4 REFS  
 Subfile B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: For reference to paper by Weichert, D. H., and Milne, W. G., see Seismol. Soc. Am., Bull., vol. 69, p. 1549, 1979.  
 Latitude: N120000 Longitude: W0520000; W1410000  
 Descriptors: \*automatic data processing; \*geologic hazards; \*earthquakes; \*seismology; engineering geology; prediction; seismic risk; Canada; probability; mathematical methods; magnitude; detection

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

999645 80-40440

**A study of the imperfect ditch method for rigid culverts**

Rude, L. C.  
 Univ. of Virginia, Charlottesville, Va., USA  
 274p., 1979

Subfile B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*soil mechanics; \*automatic data processing; earth pressure; engineering geology; loading; culverts;

mathematical models; models; theoretical studies;  
 deformation; finite element analysis; statistical methods;  
 design

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

999643 80-40435

**Modeling and finite element analysis of soil behavior**

Karshenas, M.  
 Univ. of Illinois, Urbana, Ill., USA  
 294p., 1979

Subfile B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*soil mechanics; \*automatic data processing; \*tunnels; earth pressure; engineering geology; models; experimental studies; mathematical models; finite element analysis; statistical methods; theoretical studies; computer programs; laboratory studies; stress; deformation

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

999104 80-40556

**Love and Rayleigh waves in an irregular soil layer**

Drake, L. A.  
 Univ. Calif., Seismogr. Stn., Berkeley, Calif., USA  
 Seismol. Soc. Am., Bull. 70: 2, 571-582p., 1980  
 CODEN: BSSAAP ISSN: 0037-1106 25 REFS.  
 Subfile B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*geologic hazards; \*soil mechanics; \*seismology; elastodynamic properties; elasticity; properties; ground motion; waves; Rayleigh waves; propagation; finite element analysis; statistical methods; layered media; theoretical studies; elastic properties; strong motion

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

998361 80-40876

**Rock stress measurements at Nagjharl tunnels, Kalmadi hydro-electric project, India**  
 Savina, P. C.; Mokhashi, S. L.; Rame Gowda, B. M.  
 Fourth congress of the International Society for Rock Mechanics, Montreux, Switzerland, September 2-8, 1979  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 589-594p., 1979

CODEN: 3Z2UA4 ISSN 0074-848X 8 REFS.

Subfile: B  
 Country of Publ.: Varies  
 Doc. Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., tables  
 Descriptors: India; rock mechanics; engineering geology; case studies; tunnels; Asia; dams; Nagjharl tunnels;  
 statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

998356 80-40869

**Role of stabilizing pillars in the alleviation of rock burst hazard in deep mines**  
 Salamon, M. D. G.; Wagner, H.  
 Fourth congress of the International Society for Rock Mechanics, Montreux, Switzerland, September 2-8, 1979  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 561-566p., 1979

CODEN: 3Z2UA4 ISSN 0074-848X 5 REFS.

Subfile: B  
 Country of Publ.: Varies  
 Doc. Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., tables  
 Descriptors: rock mechanics; case studies; mining; stress; mathematical models; models; statistical analysis; rock bursts  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

998343 80-40806

**Skin resistance tests of model piles in hard rocks**  
 Nemeck, J. M.  
 Fourth Congress of the International Society for Rock Mechanics, Montreux, Switzerland, September 2-8, 1979  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 475-478p., 1979

CODEN: 3Z2UA4 ISSN: 0074-848X

Subfile: B  
 Country of Publ.: Varies  
 Doc. Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English Summary Languages: German  
 illus.  
 Descriptors: rock mechanics; foundations; materials; properties; piles; adhesion; statistical analysis;  
 materials; properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

998314 80-40877

**An analysis of several borehole techniques for determining stress and modulus**  
 Hustrulid, W.  
 Colorado Sch. Mines, Golden, Colo., USA  
 Fourth Congress of the International Society for Rock Mechanics, Montreux, Switzerland, September 2-8, 1979  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 249-258p., 1979

CODEN: 3Z2UA4 ISSN 0074 848x 20 REFS

Subfile: B  
 Country of Publ.: Varies  
 Doc. Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., tables  
 Descriptors: rock mechanics; materials; properties; stress; statistical analysis; materials; properties; instruments; boreholes  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

998208 80-40578  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 95-98p., 1979  
 CODEN: 32ZUA4 ISSN: 0074-848X 6 REFS.  
 Subfile: B

**Allgemeine Geotechnische Gesichtspunkte und Grenzgleich-Gewichts-betrachtungen als erste Orientierung bei der Planung von Talsperren**  
**General geotechnical considerations and finite element analysis in the planning of dam foundations**  
 Fecker, E.; Mueller, L.; Reik, G.  
 Fourth Congress of the International Society for Rock Mechanics, Montreux, Switzerland, September 2-8, 1979  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 131-140p., 1979

CODEN: 32ZUA4 ISSN: 0074-848X 6 REFS.  
 Subfile: B  
 Country of Publ.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: English  
 illus., tables  
 Descriptors: \*rock mechanics; \*dams; \*foundations; excavations; methods; structure; statistical analysis; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

998284 80-40483  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 35-40p., 1979  
 CODEN: 32ZUA4 ISSN: 0074-848X  
 Subfile: B

**Statistical classification of seismic measurements and dam barrages**  
**Classement statistique de mesures sismiques et conception de barrages**  
 Bertrand, Y.; Lakshmanan, J.; Rouge, J.  
 Fourth Congress of the International Society for Rock Mechanics, Montreux, Switzerland, September 2-8, 1979  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 35-40p., 1979

CODEN: 32ZUA4 ISSN: 0074-848X  
 Country of Publ.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: French Summary Languages: English  
 illus.  
 Descriptors: \*dams; \*rock mechanics; excavations; seismicity; grouting; experimental studies; granite; granite-grandodiorite family; schist; schists  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

998295 80-40551  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 105-112p., 1979  
 CODEN: 32ZUA4 ISSN: 0074-848X 8 REFS.  
 Subfile: B

**Site investigations and FEM calculations for two underground caverns in Peru**  
**Investigaciones de campo y calculos de elementos finitos para dos cavernas en el Peru**  
 Onzalvo, M.; Drozd, K.  
 Fourth Congress of the International Society for Rock Mechanics, Montreux, Switzerland, September 2-8, 1979  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 105-112p., 1979

CODEN: 32ZUA4 ISSN: 0074-848X 8 REFS.  
 Country of Publ.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: German  
 illus., tables  
 Latitude: S181500; Longitude: W0700000; W0811000  
 Descriptors: \*Peru; \*rock mechanics; engineering geology; case studies; underground installations; power plants; South America; excavations; shear strength; statistical analysis; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

998293 80-40545  
 Int. Soc. Rock Mech., Congr., Proc., 4, Vol. 2, 1979  
 CODEN: 32ZUA4 ISSN: 0074-848X 6 REFS.  
 Subfile: B

**L'identification des roches par l'indice de continuite**  
**Rock identification by means of continuity index**  
 Denis, A.; Panet, M.; Touring, C.  
 Fourth Congress of the International Society for Rock Mechanics, Montreux, Switzerland, September 2-8, 1979

CODEN: 32ZUA4 ISSN: 0074-848X 6 REFS.  
 Country of Publ.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: French Summary Languages: English  
 illus.  
 Descriptors: \*rock mechanics; experimental studies; granite; granite-grandodiorite family; schist; schists  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

996619 80-35664  
**Simplified finite-element models for reservoir flow problems**  
 Dalen, V. Soc. Pet. Eng. AIME, J. 19: 5, 333-343p., 1979  
 CODEN: SPTUJ4 ISSN: 0037-9999 25 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.

996336 80-35727  
**Wave propagation and its characteristics due to underground loading**  
 Goto, H.; Takada, S.; Yoshida, A. Kyoto Univ., Disaster Prev. Res. Inst., Ann. 17B, 417-438, 1974  
 CODEN: KOBKAW ISSN: 0386-412X 6 REFS.  
 Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus.

996578 80-35626  
**Digital terrain analysis for land evaluation**  
 Carrara, A.; Catalano, E.; Sorriso Valvo, M.; Reali, C.; Osso, I. Geol. Appl. Idrogemol. 13, 69-127p., 1978  
 CODEN: GAIDRG ISSN: 0435-3870 100 REFS.  
 Subfile: B  
 Country of Publ.: Italy  
 Doc Type: SERIAL; MAP Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: Italian  
 illus.: land use maps  
 Latitude: N393000; N403000 Longitude: E0160000  
 Descriptors: Italy; automatic data processing; geomorphology; environmental geology; engineering geology; land use; land use maps; slope stability; Europe; Calabria; Ferro Basin; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

996330 80-35949  
**Moduli of elasticity of soils and their application to deformation analysis of soil structures**  
 Sugano, Y.; Watanabe, H.; Matsuoka, H. Kyoto Univ., Disaster Prev. Res. Inst., Ann. 17B, 335-346, 1974  
 CODEN: KOBKAW ISSN: 0386-412X 7 REFS.  
 Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus.

996392 80-36005  
**The predicted performance of soft clay under a trial embankment loading based on the Cam-Clay model**  
 Wroth, C. P. Settlement and stability of earth embankments on soft foundations  
 Settlement and stability of earth embankments on soft foundations. Crowthorne, United Kingdom, April 23, 1976  
 TRRL Suppl. Rep. 399, 22-42p., 1978  
 ISSN: 0305-1315 8 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Note With discussion, illus., table, sect.

996330 80-35949  
**Moduli of elasticity of soils and their application to deformation analysis of soil structures**  
 Sugano, Y.; Watanabe, H.; Matsuoka, H. Kyoto Univ., Disaster Prev. Res. Inst., Ann. 17B, 335-346, 1974  
 CODEN: KOBKAW ISSN: 0386-412X 7 REFS.  
 Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus.

996330 80-35949  
**Moduli of elasticity of soils and their application to deformation analysis of soil structures**  
 Sugano, Y.; Watanabe, H.; Matsuoka, H. Kyoto Univ., Disaster Prev. Res. Inst., Ann. 17B, 335-346, 1974  
 CODEN: KOBKAW ISSN: 0386-412X 7 REFS.  
 Subfile: B  
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 Languages: Japanese Summary Languages: English  
 illus.

996330 80-35949  
**Moduli of elasticity of soils and their application to deformation analysis of soil structures**  
 Sugano, Y.; Watanabe, H.; Matsuoka, H. Kyoto Univ., Disaster Prev. Res. Inst., Ann. 17B, 335-346, 1974  
 CODEN: KOBKAW ISSN: 0386-412X 7 REFS.  
 Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus.

995928 80-35703

**Relation of beach erosion to sediment patterns, Rhode Island barrier beaches**

Fisher, J. J.; Hagstrom, E. L.  
Univ. R.I., Dep. Geol., Kingston, R.I., USA; Phillips Pat., USA

The Geological Society of America, Northeastern Section, 15th annual meeting, Philadelphia, Pa., United States, March 13-15, 1980

Geol. Soc. Am., Abstr. Programs 12: 2, 35-36p., 1980

CODEN: GAAPRC ISSN: 0016-7592

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English

Latitude: N411000 Longitude: W0710700; W0715500

Descriptors: \*Rhode Island; \*sedimentation; \*geomorphology

; engineering geology; environment; shore features

; shorelines; coastal environment; beaches; United States

; erosion; barrier beaches; rates; changes; marine transport

; statistical analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

995548 80-35872

**Physical property statistics or how to hide an anomaly**

O'hoert, G. R.

U. S. Geol. Surv., Denver, Colo., USA

Society of Exploration Geophysicists, 49th annual

international meeting, New Orleans, La., United States,

Nov. 4-8, 1979

Soc. Explor. Geophys., Annu. Int. Meet., Abstr. 49, 51-52

p., 1979

CODEN: SGAMB7

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*rock mechanics; \*mineral exploration;

materials; properties; statistical methods; physical

properties; anomalies; materials, properties; automatic

data processing; geophysical methods; density; electrical

properties

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

995409 80-35658

**Probability of earthquake ground accelerations in San Diego**

Cross, C. B.

Figro, Long Beach, Calif., USA

**Earthquakes and other perils, San Diego region**  
Abbott, P. L. (EDITOR); Elliott, W. J. (EDITOR)  
Publ.: San Diego Assoc. Geol.  
107-113p., 1979  
7 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: BOOK Bibliographic Level: ANALYTIC

Languages: English

illus., sketch map

Latitude: N324500; N324500 Longitude: W1171000; W1171000

Descriptors: \*California; engineering geology;

earthquakes; United States; acceleration; ground motion;

San Diego; statistical methods; mathematical models; models

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

995217 80-35493

**The correlation of response spectral amplitudes with seismic intensity**

O'Brien, L. J.

Comput. Sci. Corp., Falls Church, Va., USA

variously paginatedp., 1980

12 REFS.

Subfile: B

Doc Type: REPORT Bibliographic Level: MONOGRAPHIC

Languages: English

Report No.: MUREG/CR-1259

Availability: NTIS, Springfield, Va., United States

illus., tables

Descriptors: \*seismology; \*earthquakes; effects;

intensity; ground motion; amplitude; response spectra;

statistical analysis; frequency; strong motion;

applications; engineering geology; magnitude

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

995102 80-35812

Statisticheskly podkhod k zadachem rayonirovaniya massivov gornyykh porod  
Statistical approach to problems in the classification of rock complexes  
Levashin, M. N.; Aleshin, Yu. G.

Napryazhennoye sostoyaniye i prochnost' massivov gornyykh porod  
Avtmatov, I. T. (EDITOR)  
Publ. 12d 111m  
38-54p., 1977  
9 REFS.

Subfile: B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: Russian  
illus., tables  
Descriptors: rock mechanics; materials; properties; statistical methods; engineering geology; methods; stochastic processes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

995074 80-35623

Winters in France  
characterisation and principal types of  
Camard, L.

Soil freezing and highway construction  
Williams, P. J. (EDITOR); Fremont, M. (EDITOR)  
Soil freezing and highway construction, Ottawa, Ont., Canada, Oct. 17-21, 1977  
Publ.: Carleton Univ. Ecole Nat. des ponts et chaussees  
40-44p., 1977  
2 REFS.

Subfile: B  
Country of Publ.: France  
Doc Type: BOOK CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: France; permafrost; engineering geology; frost action; soil mechanics; Europe; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

994567 80-35609

Freshwater reserves of Mid-Atlantic coast barrier islands  
Rohlfed, F. H.; Hornberger, G. M.; Dolan, R.; Hayden, B. P.  
Univ. Va. Dep. Environ. Sci., Charlottesville, Va., USA  
Environ. Geol. 3, 1, 11p., 1980  
CODEN: ENRGE0 ISSN: 0099-0694 16 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, sketch maps  
Latitude: N340000; N400000 Longitude: W0750000; W0790000  
Descriptors: Maryland; Virginia; North Carolina; ground water; hydrology; engineering geology; surveys; shorelines; Atlantic Coastal Plain; barrier islands; United States; environmental geology; Assateague Island; Outer Banks; North America; aquifers; mathematical models; water resources; reserves  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

994481 80-35902

A method of analysis of the effects of volume change in unstaturated expansive clays on engineering structures  
Richards, B. G.

Aust. Geomech. J. 69, 27-41p., 1979  
CODEN: AUGJBU ISSN: 0319-4458 44 REFS.

Subfile: B  
Country of Publ.: Australia  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: soil mechanics; materials; properties; expansive materials; engineering geology; materials; properties; elastic strain; finite element analysis; statistical methods; elasticity; stress; plasticity; clays; moisture; mathematical models; models; consolidation; case studies; applications  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

994095 80-35645

**Probability of pillar failure at Elliot Lake**  
Coates, D. F.

**Advances in rock mechanics--Progres en mecanique des roches--Fortschritte in der Felsmechanik; Events and discussion**  
Wallace, G. B. (chairperson)  
Third congress of the International Society of Rock Mechanics; Advances in rock mechanics. Denver, Colo., United States, September 1-7, 1974  
Int. Soc. Rock Mech., Congr., Proc., 3, Vol. 3, 133-143p., 1974  
CODEN J2ZUA4 ISSN: 0074-848X B REFS.  
Subfile B  
Country of Publ.: Varies

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.  
Descriptors: Ontario; rock mechanics; engineering geology; experimental studies; foundations; Canada; Elliot Lake  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

992938 80-35810

**Improvement of reservoir simulation by a triangular discontinuous finite element method**

Lemonnier, P. A.  
54th annual fall technical conference and exhibition of the Society of Petroleum Engineers of AIME, Las Vegas, Nev., United States, Sept. 23-26, 1979  
Soc. Pet. Eng. AIME, Annu. Fall Tech. Conf. Exhib., Pap. 54 1-11p., 1979  
ISSN 0960-642X 12 REFS.

Subfile B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Note: SPT A249, illus., tables  
Descriptors: engineering geology; petroleum engineering; reservoir rocks; reservoir properties; experimental studies; finite element analysis; statistical methods; mathematical models; models; three-dimensional models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

992683 80-35486

**Probabilistic procedures for assessing soil liquefaction potential**

McGuire, R. K.; Tatsuoka, F.; Iwasaki, T.; Tokidu, K. I.

U. S. Geol. Surv., Denver, Colo., USA  
J. Res. (Tokyo) 19, 38p., 1978  
CODEN: JRPWAI 37 REFS.

Subfile: B  
Country of Publ.: Japan  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC

Languages: English  
illus., tables, sketch map  
Latitude: N353000; N355000 Longitude: E1401000; E1394500  
Descriptors: Japan; soil mechanics; earthquakes; engineering geology; materials; properties; effects; liquefaction; Asia; Honshu; Tokyo Bay; reclamation; sand; clastic sediments; seismicity; probability; acceleration; shear stress; ground motion; strong motion; statistical analysis; strength; shear strength; liquefaction potential index; penetration tests; in situ; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

992518 80-35611

**Studio delle deformazioni in una coltre argillosa dovute a movimenti lungo faglie nel substrato clays due to movements along faults in the bedrock**

Bosi, C.; Cappellari, G.; Ottaviani, M.  
Geogr. Fis. Din. Quaternaria 2, 1, 29-34p., 1979  
ISSN: 0084-8948 11 REFS.

Subfile: B  
Country of Publ.: Italy  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Italian Summary Languages: English  
illus., tables  
Descriptors: soil mechanics; faults; deformation; displacements; clays; normal faults; finite element analysis; statistical methods; bedrock  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

992302 80-35572

**Fundamental study on instability of tunnel in consideration of post peak strain softening behavior of rock**

Arai, K.; Mori, M.  
Kyoto Univ., Fac. Eng., Mem. 40, Part 2, 78-99p., 1978  
CODEN MEKYAC ISSN 0023-6063 17 REFS.

Subfile: B  
Country of Publ.: Japan

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

illus.: tunnels; rock mechanics; stability; methods; finite element analysis; statistical methods; Mohr envelope; Coulomb's law; strain; failure; stress; elastoplastic materials; tensile strength  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

991523 80-30785

**Metodyka badan wlasnosci skal przy wykorzystaniu petroskopu****A study of rock properties using a petroscope**

Dlascowski, W.; Wachelka, L.; Hanas, A.  
Przegi Geol., 27, 10(318), 557-562p., 1979  
CODEN PRZGAL ISSN: 0033-2451 6 REFS.

Subfile: B

Country of Publ.: Poland

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Polish Summary Languages: English

illus.: table  
Descriptors: rock mechanics; materials; properties; compressive strength; physical properties; instruments; techniques; statistical analysis; acoustical methods; geophysical methods; materials, properties; petrosopes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

990940 80-30783

**On fundamental nature of microtremors and its application**

Nogoshi, M.  
Akita Univ., Min. Coll., J., Ser. A 5 3, 1-51p., 1978  
CODEN JMMAAF ISSN 0568-7365 65 REFS.

Subfile: B

Country of Publ.: Japan

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

illus.: tables  
Latitude: N413000 Longitude: E1413000; E1403000  
Descriptors: Japan; seismology; engineering geology; microseisms; earthquakes; applications; effects; damage; aseismic design; Asia; Hokkaido; Hakodate; statistical analysis; seismograms; wavefronts; waveforms  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

990495 80-30644

**Stabilization of Idikki arch dam foundation**

Desimukh, A. M.  
Indian Geotech. J., 8: 2, 81-90p., 1978  
CODEN IGJTAG 9 REFS.

Subfile: B

Country of Publ.: India

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
illus.: table, sects.  
Latitude: N080000 Longitude: E0750000; E0750000  
Descriptors: India; engineering geology; dams; Asia; Kerala; arch dams; Idikki Dam; Periyar River; finite element analysis; statistical methods; loading; stability; seepage; controls; grouting; foundations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

990298 80-30875

**The use of synthetic series in hydraulic design**

Torelli, L.; Tomasi, P.

Special Issue 1977; 4th Iraqi geological congress  
4th Iraqi geological congress, Baghdad, Iraq, March, 1976

Geol. Soc. Iraq, J., 235-246p., 1977

CODEN: GSJUAN ISSN: 0533-8301

Subfile: B

Country of Publ.: Iraq

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
illus.: tables, sketch map  
Descriptors: waterways; dams; design; statistical methods; hydraulics; hydrology; simulation; Aveto River; Trebbia River; Iraq; Middle East; rivers and streams; reservoirs; discharge; engineering geology; storage  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

988828 PO-32038  
**Economic considerations and risk analysis in formulating reservoir development plans**  
 Mortada, M.

Country of Pub.: Kuwait  
 Doc Type: BOOK  
 Languages: English  
 Note: With discussion. illus., tables  
 Descriptors: engineering geology; petroleum; economics; engineering; production; risk analysis; possibilities; subsurface reservoirs; development; models  
 Statistical analysis; reserves; exploration; energy sources  
 Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

988093 80-31509  
**Inzhenerno-geologicheskiye osobennosti zhelezorudnykh mestorozhdeniy**  
 Engineering-geological features of iron deposits  
 Glushko, V. T.; Borisenko, V. G.  
 Pub.: Izd. Nedra  
 251p. 1978  
 179 REFS  
 Subfile: B  
 Country of Pub.: Union of Soviet Socialist Republics  
 Doc Type: BOOK  
 Languages: Russian  
 Illus.: tables  
 Latitude: N473000 Longitude: E0323000  
 Descriptors: USSR; engineering geology; economic geology; materials; properties; iron; ore deposits; Krivoy Rog Basin; statistical analysis; instruments  
 Section Headings: 27 (ECONOMIC GEOLOGY, METALS)

988076 80-20762  
**Raschet svay s ispol'zovaniyem drobno-lineynoy zavisimosti**  
 Calculation for piles using particle-linear functions  
 Mikhaylov, Yu. S.

Country of Pub.: Union of Soviet Socialist Republics  
 Doc Type: BOOK  
 Languages: Russian  
 Descriptors: \*permafrost; \*foundations; engineering properties; piles; plasticity; bearing capacity; mathematical methods; engineering geology; construction; stability; materials; properties; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

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 Languages: Russian  
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 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

987560 80-29499  
**Variation of density with rock type, depth, and formation in the Western Canada Basin from density logs**  
 Maxant, J.  
 Hydro-Que., Geol. Dep., Montreal, Que., CAN  
 Geophysics 45: 6, 1061-1076p., 1980  
 CODEN: GPYSA7 ISSN: 0016-8033 19 REFS  
 Subfile: B  
 Country of Pub.: United States  
 Doc Type: SERIAL  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: Can. Earth Phys. Branch; Contrib. No. 799. illus., tables, sketch maps  
 Latitude: N490000 Longitude: W1000000  
 Descriptors: \*Canada; well-logging; Alberta; Saskatchewan; \*rock mechanics; sedimentary rocks; geophysical surveys; materials; properties; Western Canada Basin; density; gamma-gamma methods; limestone; clastic rocks; depth; stratigraphic units; sandstone; lithology; statistical carbonate rocks; dolostone; shale; Mesozoic; analysis; Paleozoic; Phanerozoic; Cretaceous; Mesozoic; Beaverhill Lake Formation; Duperow Formation; Manitowille Formation; Colorado Group; skewness; geophysical methods; materials; properties  
 Section Headings: 17 (GEOPHYSICS, GENERAL)

988828 PO-32038  
**Economic considerations and risk analysis in formulating reservoir development plans**  
 Mortada, M.

Country of Pub.: Kuwait  
 Doc Type: BOOK  
 Languages: English  
 Note: With discussion. illus., tables  
 Descriptors: engineering geology; petroleum; economics; engineering; production; risk analysis; possibilities; subsurface reservoirs; development; models  
 Statistical analysis; reserves; exploration; energy sources  
 Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

988093 80-31509  
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 Engineering-geological features of iron deposits  
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 251p. 1978  
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 Section Headings: 27 (ECONOMIC GEOLOGY, METALS)

988076 80-20762  
**Raschet svay s ispol'zovaniyem drobno-lineynoy zavisimosti**  
 Calculation for piles using particle-linear functions  
 Mikhaylov, Yu. S.

Country of Pub.: Union of Soviet Socialist Republics  
 Doc Type: BOOK  
 Languages: Russian  
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 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

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 Hydro-Que., Geol. Dep., Montreal, Que., CAN  
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 CODEN: GPYSA7 ISSN: 0016-8033 19 REFS  
 Subfile: B  
 Country of Pub.: United States  
 Doc Type: SERIAL  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: Can. Earth Phys. Branch; Contrib. No. 799. illus., tables, sketch maps  
 Latitude: N490000 Longitude: W1000000  
 Descriptors: \*Canada; well-logging; Alberta; Saskatchewan; \*rock mechanics; sedimentary rocks; geophysical surveys; materials; properties; Western Canada Basin; density; gamma-gamma methods; limestone; clastic rocks; depth; stratigraphic units; sandstone; lithology; statistical carbonate rocks; dolostone; shale; Mesozoic; analysis; Paleozoic; Phanerozoic; Cretaceous; Mesozoic; Beaverhill Lake Formation; Duperow Formation; Manitowille Formation; Colorado Group; skewness; geophysical methods; materials; properties  
 Section Headings: 17 (GEOPHYSICS, GENERAL)

988828 PO-32038  
**Economic considerations and risk analysis in formulating reservoir development plans**  
 Mortada, M.

Country of Pub.: Kuwait  
 Doc Type: BOOK  
 Languages: English  
 Note: With discussion. illus., tables  
 Descriptors: engineering geology; petroleum; economics; engineering; production; risk analysis; possibilities; subsurface reservoirs; development; models  
 Statistical analysis; reserves; exploration; energy sources  
 Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

988093 80-31509  
**Inzhenerno-geologicheskiye osobennosti zhelezorudnykh mestorozhdeniy**  
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 251p. 1978  
 179 REFS  
 Subfile: B  
 Country of Pub.: Union of Soviet Socialist Republics  
 Doc Type: BOOK  
 Languages: Russian  
 Illus.: tables  
 Latitude: N473000 Longitude: E0323000  
 Descriptors: USSR; engineering geology; economic geology; materials; properties; iron; ore deposits; Krivoy Rog Basin; statistical analysis; instruments  
 Section Headings: 27 (ECONOMIC GEOLOGY, METALS)

988076 80-20762  
**Raschet svay s ispol'zovaniyem drobno-lineynoy zavisimosti**  
 Calculation for piles using particle-linear functions  
 Mikhaylov, Yu. S.

Country of Pub.: Union of Soviet Socialist Republics  
 Doc Type: BOOK  
 Languages: Russian  
 Descriptors: \*permafrost; \*foundations; engineering properties; piles; plasticity; bearing capacity; mathematical methods; engineering geology; construction; stability; materials; properties; statistical analysis  
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 CODEN: GPYSA7 ISSN: 0016-8033 19 REFS  
 Subfile: B  
 Country of Pub.: United States  
 Doc Type: SERIAL  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: Can. Earth Phys. Branch; Contrib. No. 799. illus., tables, sketch maps  
 Latitude: N490000 Longitude: W1000000  
 Descriptors: \*Canada; well-logging; Alberta; Saskatchewan; \*rock mechanics; sedimentary rocks; geophysical surveys; materials; properties; Western Canada Basin; density; gamma-gamma methods; limestone; clastic rocks; depth; stratigraphic units; sandstone; lithology; statistical carbonate rocks; dolostone; shale; Mesozoic; analysis; Paleozoic; Phanerozoic; Cretaceous; Mesozoic; Beaverhill Lake Formation; Duperow Formation; Manitowille Formation; Colorado Group; skewness; geophysical methods; materials; properties  
 Section Headings: 17 (GEOPHYSICS, GENERAL)

988828 PO-32038  
**Economic considerations and risk analysis in formulating reservoir development plans**  
 Mortada, M.

Country of Pub.: Kuwait  
 Doc Type: BOOK  
 Languages: English  
 Note: With discussion. illus., tables  
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 Statistical analysis; reserves; exploration; energy sources  
 Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

988093 80-31509  
**Inzhenerno-geologicheskiye osobennosti zhelezorudnykh mestorozhdeniy**  
 Engineering-geological features of iron deposits  
 Glushko, V. T.; Borisenko, V. G.  
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 179 REFS  
 Subfile: B  
 Country of Pub.: Union of Soviet Socialist Republics  
 Doc Type: BOOK  
 Languages: Russian  
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 Latitude: N473000 Longitude: E0323000  
 Descriptors: USSR; engineering geology; economic geology; materials; properties; iron; ore deposits; Krivoy Rog Basin; statistical analysis; instruments  
 Section Headings: 27 (ECONOMIC GEOLOGY, METALS)

988076 80-20762  
**Raschet svay s ispol'zovaniyem drobno-lineynoy zavisimosti**  
 Calculation for piles using particle-linear functions  
 Mikhaylov, Yu. S.

Country of Pub.: Union of Soviet Socialist Republics  
 Doc Type: BOOK  
 Languages: Russian  
 Descriptors: \*permafrost; \*foundations; engineering properties; piles; plasticity; bearing capacity; mathematical methods; engineering geology; construction; stability; materials; properties; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

987560 80-29499  
**Variation of density with rock type, depth, and formation in the Western Canada Basin from density logs**  
 Maxant, J.  
 Hydro-Que., Geol. Dep., Montreal, Que., CAN  
 Geophysics 45: 6, 1061-1076p., 1980  
 CODEN: GPYSA7 ISSN: 0016-8033 19 REFS  
 Subfile: B  
 Country of Pub.: United States  
 Doc Type: SERIAL  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: Can. Earth Phys. Branch; Contrib. No. 799. illus., tables, sketch maps  
 Latitude: N490000 Longitude: W1000000  
 Descriptors: \*Canada; well-logging; Alberta; Saskatchewan; \*rock mechanics; sedimentary rocks; geophysical surveys; materials; properties; Western Canada Basin; density; gamma-gamma methods; limestone; clastic rocks; depth; stratigraphic units; sandstone; lithology; statistical carbonate rocks; dolostone; shale; Mesozoic; analysis; Paleozoic; Phanerozoic; Cretaceous; Mesozoic; Beaverhill Lake Formation; Duperow Formation; Manitowille Formation; Colorado Group; skewness; geophysical methods; materials; properties  
 Section Headings: 17 (GEOPHYSICS, GENERAL)

988828 PO-32038  
**Economic considerations and risk analysis in formulating reservoir development plans**  
 Mortada, M.

Country of Pub.: Kuwait  
 Doc Type: BOOK  
 Languages: English  
 Note: With discussion. illus., tables  
 Descriptors: engineering geology; petroleum; economics; engineering; production; risk analysis; possibilities; subsurface reservoirs; development; models  
 Statistical analysis; reserves; exploration; energy sources  
 Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

987501 80-30540  
**Behavior of slopes in weakly cemented soils under static and dynamic loading**  
 Sitar, N.  
 Stanford Univ., Stanford, Calif., USA  
 183p., 1979  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Pub.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*soil mechanics; \*deformation; \*slope stability; \*failure; field studies; \*tensile strength; cementation; diagenesis; loading; cyclic loading; dynamic loading; static loading; experimental studies; theoretical studies; finite element analysis; statistical methods; elastic properties; earthquakes; geologic hazards  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

987497 80-30543  
**Seepage erosion of geotechnical structures subjected to confined flow; a probabilistic design approach**  
 van Zyl, D. J. A.  
 Purdue Univ., West Lafayette, Indiana, USA  
 261p., 1979  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Pub.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*foundations; \*seepage; erosion; design; failure; probability; experimental studies; granular materials; soil mechanics  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

987451 80-29447  
**Intensity of systematic joints; methods and application**  
 Wheeler, R. L.; Dixon, J. M.  
 W. Va. Univ., Dep. Geol. and Geogr., Morgantown, W. Va., USA  
 Geology (Boulder), 8(5), 230-233p., 1980  
 COREN: GIGYEA ISSN: 0091-7613 21 REFS.  
 Subfile: B  
 Country of Pub.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N32.7000 Longitude: W064.0000 #0870000  
 Descriptors: \*Appalachians; \*structural analysis; \*fractures  
 rock mechanics; structural geology; style; methods;

987096 80-30205  
**Seepage characteristics through an abandoned tailings pile**  
 Morilla, A. G.; Fortier, D. H.  
 Univ. Idaho, Moscow, Idaho, USA  
 El agua en la mineria y trabajos subterraneos; V. 1-III  
 Fernandez-Rubio, R. (EDITOR); Benavente Herrera, J. (EDITOR); Lopez Egea, A. (EDITOR); Pulido Bosch, A. (EDITOR); Tobes Gonzalez, M. A. (EDITOR); Valle Cardenete, M. (EDITOR); Vague Ballester, A. (EDITOR)  
 SIAMDS-78: El agua en la mineria y trabajos subterraneos, Granada, Spain.  
 Publ.: Asoc. Nac. Ing. Minas  
 847-862p., 1978  
 6 REFS.  
 Subfile: B  
 Country of Pub.: Spain  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., sketch maps  
 Latitude: N4700000 Longitude: W1171500  
 Descriptors: \*mining geology; \*ground water; \*Idaho; \*automatic data processing; \*hydrology; production control; hydrogeology; surveys; underground installations; engineering geology; mining; mines; United States; mathematical models; models; finite element analysis; statistical methods; precipitation  
 Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

987096 80-30205  
**Seepage characteristics through an abandoned tailings pile**  
 Morilla, A. G.; Fortier, D. H.  
 Univ. Idaho, Moscow, Idaho, USA  
 El agua en la mineria y trabajos subterraneos; V. 1-III  
 Fernandez-Rubio, R. (EDITOR); Benavente Herrera, J. (EDITOR); Lopez Egea, A. (EDITOR); Pulido Bosch, A. (EDITOR); Tobes Gonzalez, M. A. (EDITOR); Valle Cardenete, M. (EDITOR); Vague Ballester, A. (EDITOR)  
 SIAMDS-78: El agua en la mineria y trabajos subterraneos, Granada, Spain.  
 Publ.: Asoc. Nac. Ing. Minas  
 847-862p., 1978  
 6 REFS.  
 Subfile: B  
 Country of Pub.: Spain  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., sketch maps  
 Latitude: N4700000 Longitude: W1171500  
 Descriptors: \*mining geology; \*ground water; \*Idaho; \*automatic data processing; \*hydrology; production control; hydrogeology; surveys; underground installations; engineering geology; mining; mines; United States; mathematical models; models; finite element analysis; statistical methods; precipitation  
 Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

987096 80-30205  
**Seepage characteristics through an abandoned tailings pile**  
 Morilla, A. G.; Fortier, D. H.  
 Univ. Idaho, Moscow, Idaho, USA  
 El agua en la mineria y trabajos subterraneos; V. 1-III  
 Fernandez-Rubio, R. (EDITOR); Benavente Herrera, J. (EDITOR); Lopez Egea, A. (EDITOR); Pulido Bosch, A. (EDITOR); Tobes Gonzalez, M. A. (EDITOR); Valle Cardenete, M. (EDITOR); Vague Ballester, A. (EDITOR)  
 SIAMDS-78: El agua en la mineria y trabajos subterraneos, Granada, Spain.  
 Publ.: Asoc. Nac. Ing. Minas  
 847-862p., 1978  
 6 REFS.  
 Subfile: B  
 Country of Pub.: Spain  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., sketch maps  
 Latitude: N4700000 Longitude: W1171500  
 Descriptors: \*mining geology; \*ground water; \*Idaho; \*automatic data processing; \*hydrology; production control; hydrogeology; surveys; underground installations; engineering geology; mining; mines; United States; mathematical models; models; finite element analysis; statistical methods; precipitation  
 Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

987095 80-30198

**Free surface flow in porous media by finite element methods**  
Martins, J. B.; Matos, A. C.; Bianchi, A.

**El agua en la minería y trabajos subterráneos; V. I-III**  
Fernandez-Rubio, R. (EDITOR); Benavente Herrera, J. (EDITOR); Lopez Egea, A. (EDITOR); Pulido Bosch, A. (EDITOR); Tobes Gonzalez, M. A. (EDITOR); Valle Cardenete, M. (EDITOR); Vague Ballester, A. (EDITOR)

SIAMOS-78 : El agua en la minería y trabajos subterráneos, Granada, Spain.  
Publ: Asoc. Nac. Ing. Minas  
825-846p. 1978  
31 REFS.

Subfile: B  
Country of Publ.: Spain  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English Summary Languages: French

Descriptors: mining geology; ground water; production control; movement; finite element analysis; surveys; hydrogeology; underground installations; engineering geology; mining; mines; statistical methods; mathematical models; models; porous media  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

987092 80-30677

**Reliability and the factor of safety due to piping**

Harr, M. E.; Sipher, D. J.  
Purdue Univ., Sch. Civ. Eng., West Lafayette, Indiana, USA

**El agua en la minería y trabajos subterráneos; V. I-III**  
Fernandez-Rubio, R. (EDITOR); Benavente Herrera, J. (EDITOR); Lopez Egea, A. (EDITOR); Pulido Bosch, A. (EDITOR); Tobes Gonzalez, M. A. (EDITOR); Valle Cardenete, M. (EDITOR); Vague Ballester, A. (EDITOR)

SIAMOS-78 : El agua en la minería y trabajos subterráneos, Granada, Spain.  
Publ: Asoc. Nac. Ing. Minas  
775-788p. 1978  
4 REFS.

Subfile: B  
Country of Publ.: Spain  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Descriptors: mining geology; ground water; automatic data processing; production control; engineering geology; movement; soil mechanics; mines; surveys; hydrogeology; underground installations; mining; finite element analysis; statistical methods; mathematical models; models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984581 80-25706

**Application of seismic risk procedures to problems in microzonation**

Anderson, J. G.; Trifunac, M. D.  
Univ. South. Calif., Dep. Civ. Eng., Los Angeles, Calif., USA

Sherif, M. A. (Chairperson)  
Second International conference on microzonation for safer construction: research and application, San Francisco, Calif., United States, Nov. 26-Dec. 1, 1978  
Proc. Int. Conf. Microzonation Safer Constr.-Res. Appl. 2, Vol. 1, 559-569p., 1978  
17 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Plus: table, sketch maps  
Latitude: N333000; N250000 Longitude: W1174000; W1190000  
Descriptors: California; seismology; engineering geology; earthquakes; microzoning; seismic risk; United States; Los Angeles region; ground motion; strong motion; prediction; probability; seismicity; attenuation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984575 80-26101

**Zonation for critical facilities based on two-level earthquakes**  
 Patwardhan, A. S.; Tillson, D. D.; Nowack, R. L.  
 Woodward-Clyde Consult., San Francisco, Calif., USA; Wash.  
 Public Power Supply Syst., USA  
 Sherif, M. A. (chairperson)  
 Second International conference on microzonation for safer  
 construction: research and application, San Francisco,  
 Calif., United States, Nov. 26-Dec. 1, 1978  
 Proc. Int. Conf. Microzonation Safer Constr., Res. Appl. 2,  
 Vol. 1, 485-496p., 1978  
 7 REFS.

Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus., tables, sketch maps  
 Descriptors: earthquakes; seismology; effects; seismic  
 risk; zoning; engineering geology; design; ground motion;  
 site exploration; power plants; marine platforms;  
 economics; probability  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984564 80-25928

**Landslides from the February 4, 1976 Guatemala earthquake: implications for seismic hazard reduction in the Guatemala City area**  
 Harp, E. L.; Wilson, R. C.; Wleczonek, G. F.; Keefer, D. K.  
 U. S. Geol. Surv., Menlo Park, Calif., USA  
 Sherif, M. A. (chairperson)  
 Second International conference on microzonation for safer  
 construction: research and application, San Francisco,  
 Calif., United States, Nov. 26-Dec. 1, 1978  
 Proc. Int. Conf. Microzonation Safer Constr., Res. Appl. 2,  
 Vol. 1, 353-366p., 1978  
 10 REFS.

Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus., sketch maps  
 Latitude: N133000; W160000 Longitude: W0883000; W0923000  
 Descriptors: Guatemala; maps; engineering geology;  
 cartography; slope stability; landslides; earthquakes;  
 effects; Central America; seismic risk; Guatemala City  
 region; rockslides; geologic hazards; prediction;  
 probability; 1976; causes; distribution; intensity  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984412 80-25851

**Etude pluviométrique sur le district de l'agglomération de Nancy en vue de l'amélioration des réseaux d'assainissement**  
 Pluviometric study of the Nancy metropolitan area: in view  
 of the improvement in sanitation research  
 Demassieux, L.; Laborde, J. P.; Marchand, A.

**Connaître le sous-sol un atout pour l'aménagement urbain.**  
 tome 1  
 Collomb, F. (president)  
 Collongue National; connaître le sous-sol un atout pour  
 l'aménagement urbain, Lyon, France, March 13-14, 1979  
 Doc. B. R. G. M., 8, 565-576p., 1979  
 9 REFS.

Subfile: B  
 Country of Publ.: France  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: French Summary Languages: French  
 illus., block diag., tables, geol. sketch map  
 Latitude: N480000; N493000 Longitude: E0070000; E0050000  
 Descriptors: France; engineering geology; waste  
 disposal; Europe; Nancy; discharge; mathematical models;  
 models; Maurth-et-Moselle; hydrogeology; statistical  
 analysis; hydraulics; human waste; sewage; effluents;  
 site exploration; liquid waste  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984358 RO-26173

**A theoretical assessment of the screw plate test**  
Selvadurai, A. P. S.; Nicholas, T. J.  
Carleton Univ., Dep. Civil Engin., Ottawa, Ontario, CAN

**Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)**  
Wittke, W. (EDITOR)  
Third International conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A. A. Balkema  
1245-1252p., 1979  
19 REFS  
Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
table

Descriptors: soil mechanics; deformation; granular materials; engineering geology; methods; numerical analysis; loading; cohesionless materials; elasticity; finite element analysis; statistical methods; displacements  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984355 RO-26118

**A finite element method analysis of the earth anchor-soil system**  
Prieto-Portar, L. A.  
Kaiser Engineers, Kaiser Center, Oakland, Calif., USA

**Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)**  
Wittke, W. (EDITOR)  
Third International conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A. A. Balkema  
1217-1225p., 1979  
20 REFS  
Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: foundations; soil mechanics; numerical analysis; engineering geology; methods; finite element analysis; statistical methods; anchors; shear strength; stress; displacements  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984352 RO-26148

**Calculated and measured earth pressures on a deep basement wall**  
Roth, W. H.; Lee, K. L.; Crandall, L.  
Dames and Moore, Los Angeles, Calif., USA; Univ. Calif., Los Angeles, Calif., USA

**Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)**  
Wittke, W. (EDITOR)

Third International conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
Publ: A. A. Balkema  
1179-1191p., 1979  
9 REFS  
Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: soil mechanics; earth pressure; testing; engineering geology; methods; numerical analysis; foundations; retaining walls; backfill; finite element analysis; statistical methods; stress; strain; triaxial tests; elasticity; Poisson's ratio; elastic constants; shear strength  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

anchors: loading  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984350 80-25696

**Analytical determination of earth pressure due to compaction**

Aspöck, M. S.; Brown, C. B.  
Univ. Maryland, College Park, Md. USA; Univ. Washington,  
Seattle, Wash., USA

**Numerical methods in geomechanics; Volume three, 8,  
Soil-structure-interaction (foundations); 9, Soil-structure-i-  
interaction (retaining structures)**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in  
geomechanics, Aachen, Germany, Federal Republic of, April  
2-6, 1979

Publ.: A. A. Balkema  
1167-1174p., 1979  
17 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Descriptors: soil mechanics; earth pressure; bearing  
capacity; engineering geology; methods; numerical analysis;  
displacements; elasticity; finite element analysis;  
statistical methods; cohesionless materials; stiff soils;  
deformation; retaining walls; backfill; stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984749 80-25739

**Finite element analysis of soil-pipeline interaction**

Barta, G.; Cravero, M.; Pierangeli, P.; Rabagliati, U.;  
Ramasso, D.

**Numerical methods in geomechanics; Volume three, 8,  
Soil-structure-interaction (foundations); 9, Soil-structure-i-  
interaction (retaining structures)**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in  
geomechanics, Aachen, Germany, Federal Republic of, April  
2-6, 1979

Publ.: A. A. Balkema  
1153-1163p., 1979  
10 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Descriptors: soil mechanics; theoretical studies;  
bearing capacity; engineering geology; methods; numerical  
analysis; finite element analysis; statistical methods;  
mathematical models; models; elasticity; displacements;

984348 80-25830

**The prediction of the performance of flexible pavements  
using stress analysis techniques**

Cronley, P.  
**Numerical methods in geomechanics; Volume three, 8,  
Soil-structure-interaction (foundations); 9, Soil-structure-i-  
interaction (retaining structures)**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in  
geomechanics, Aachen, Germany, Federal Republic of, April  
2-6, 1979

Publ.: A. A. Balkema  
1137-1151p., 1979  
14 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Descriptors: highways; foundations; pavement;  
engineering geology; methods; numerical analysis; loading;  
elasto-plastic materials; finite element analysis;  
statistical methods; failure; stress; soil mechanics;  
Atterberg limits; pore pressure; triaxial tests  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

elasticity; failure  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984347 80-25806

**Analysis of pavements and layered foundations by finite**

**layer method**  
Cheng, Y. K.; Fan, S. C.

**Numerical methods in geomechanics; Volume three. 8.**  
**Soil-structure-interaction (foundations); 9. Soil-structure-i-**  
**nteraction (retaining structures)**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in  
geomechanics, Aachen, Germany, Federal Republic of, April  
2-6, 1979

Publ. A. A. Balkema  
1129-1135p., 1979

12 REFS

Subfile B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus: false

Descriptors: highways; foundations; base courses;

engineering geology; methods; numerical analysis; finite

element analysis; statistical methods; loading; elasticity;

stress; displacements; shear stress

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984345 80-26267

**Analytical model for drilled shaft foundations**

Witham, J. L.; Kulhawy, F. H.

D'Appolonia Consult. Eng., Pittsburgh, Pa., USA; Cornell  
Univ., Ithaca, N. Y., USA

**Numerical methods in geomechanics; Volume three. 8.**  
**Soil-structure-interaction (foundations); 9. Soil-structure-i-**  
**nteraction (retaining structures)**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in  
geomechanics, Aachen, Germany, Federal Republic of, April  
2-6, 1979

Publ. A. A. Balkema  
1115-1122p., 1979

25 REFS

Subfile B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus:

Descriptors: foundations; soil mechanics; piles;

deformation; shafts; shear strength; engineering geology;

methods; numerical analysis; finite element analysis;

statistical methods; loading; stress; displacements;

strain; Poisson's ratio; elastic constants; stiff clay;

984344 80-26188

**Installation and performance of piled foundations**

Smith, J. M.

**Numerical methods in geomechanics; Volume three. 8.**  
**Soil-structure-interaction (foundations); 9. Soil-structure-i-**  
**nteraction (retaining structures)**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in  
geomechanics, Aachen, Germany, Federal Republic of, April  
2-6, 1979

Publ. A. A. Balkema  
1107-1114p., 1979

16 REFS

Subfile: B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus:

Descriptors: foundations; piles; numerical analysis;

engineering geology; methods; finite element analysis;

statistical methods; loading; displacements; elasticity;

failure; plasticity; strain; automatic data processing;

computers; data handling

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984343 80-26130  
Elastic modulus  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

The effect of pile permeability on the stress changes around a pile driven into clay  
Randolph, M. F.; Carter, J. P.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)  
Wittke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
Publ.: A. A. Balkema  
1097-1105p., 1979  
16 REFS.  
Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic level: ANALYTIC  
Languages: English  
Descriptors: foundations; piles; stress; engineering geology; methods; numerical analysis; pore pressure; soil mechanics; loading; finite element analysis; statistical methods; permeability; deformation; elasticity; consolidation; plasticity; mathematical models; moduli; shear modulus; elastic constants; failure  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984344 80-26151  
A method for predicting the effect of piles on slope behaviour  
Rowe, R. K.; Poulos, H. G.  
Univ. Western Ontario, London, Ontario, CAN

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)  
Wittke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
Publ.: A. A. Balkema  
1073-1085p., 1979  
10 REFS.  
Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic level: ANALYTIC  
Languages: English  
illus, tables  
Descriptors: foundations; piles; stress; engineering geology; methods; numerical analysis; slope stability; soft clay; soil mechanics; failure; finite element analysis; statistical methods; displacement; elastoplastic materials; loading; stiff clay; deformation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984342 80-26116  
Analysis of laterally loaded piles  
Prater, F. G.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)  
Wittke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
Publ.: A. A. Balkema  
1087-1096p., 1979  
23 REFS.  
Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic level: ANALYTIC  
Languages: English  
illus., table  
Descriptors: foundations; piles; stress; engineering geology; methods; numerical analysis; loading; finite element analysis; statistical methods; elasticity; bearing capacity; creep; mathematical models; cyclic loading; displacements; soil mechanics; stiff soils; cyclic loading;

984341 80-26151  
A method for predicting the effect of piles on slope behaviour  
Rowe, R. K.; Poulos, H. G.  
Univ. Western Ontario, London, Ontario, CAN

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)  
Wittke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979  
Publ.: A. A. Balkema  
1073-1085p., 1979  
10 REFS.  
Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic level: ANALYTIC  
Languages: English  
illus, tables  
Descriptors: foundations; piles; stress; engineering geology; methods; numerical analysis; slope stability; soft clay; soil mechanics; failure; finite element analysis; statistical methods; displacement; elastoplastic materials; loading; stiff clay; deformation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984338 80-25737

An Eulerian formulation of the finite element method for predicting the stresses and pore water pressures around a driven pile

Banerjee, P. K.; Fathallah, R. C.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)

Witke, W (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

1053-1060p., 1979

24 REFS

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Language: English

illus

Descriptors: foundations; piles; bearing capacity; engineering geology; methods; numerical analysis; finite element analysis; statistical methods; pore pressure; stress; soil mechanics; deformation; plasticity; loading; strain; elastoplastic materials

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984337 80-26240

An interaction study of strip-footing-sand-bed system by finite element method

Varadarajan, A.; Arora, K. R.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)

Witke, W (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

1041-1051p., 1979

11 REFS

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Language: English

illus

Descriptors: foundations; design; numerical analysis; engineering geology; methods; finite element analysis; statistical methods; soil mechanics; stress; strain; displacements; elasticity; triaxial tests; footings

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984335 80-26185

Application of probability theory to the finite element method in predicting settlements in soft Bangkok Clay

Sivandran, C.; Chiev, K.; Balasubramaniam, A. S.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)

Witke, W (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

1025-1032p., 1979

7 REFS

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Language: English

illus., tables

Latitude: N054500; N203000 Longitude: E1060000; E0963000

Descriptors: Thailand; engineering geology; foundations; methods; numerical analysis; finite element analysis; statistical methods; Asia; loading; soil mechanics; stiff soils; soft soils; shear strength; triaxial tests

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984334 80 26115

Numerical analysis of soil-structure interaction for a special case of heterogeneity  
Popovic, M.; Sarac, D.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)  
Wittke, W. (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema  
1017-1023p., 1979  
4 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Descriptors: engineering geology; methods; numerical analysis; foundations; soil mechanics; elastic materials; finite element analysis; statistical methods; stress; shear strength

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984337 80 26112

Computer supported development of a numerical method for calculating nonlinear load-settlement lines of shallow foundations and loading plates with a uniform distributed load  
Pietzsch, C.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)  
Wittke, W. (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema  
1007-1016p., 1979  
23 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Descriptors: foundations; soil mechanics; automatic data processing; settlement; deformation; engineering geology; numerical analysis; consolidation; methods; loading; elasticity; stress; strain; finite element analysis; statistical methods; shear strength

984329 80-25984

Determination of deformations of footing consisted of settling soils by finite element method  
Klepikov, S. N.; Markov, A. I.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)  
Wittke, W. (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema  
975-980p., 1979  
Subfile: B

Country of Publ.: Netherlands  
Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Descriptors: foundations; design; numerical analysis; engineering geology; methods; finite element analysis; statistical methods; soil mechanics; stress; moisture; deformation; piles; strain; stiff clay

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984328 80-25977

Effect of inclined rigid layer on behaviour of strip by finite element method

Khedikar, B. S.; Patankar, M. V.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)

Witke, W.(EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A. A. Balkema

961-973p., 1979

17 REFS

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., tables

Descriptors: foundations; soil mechanics; design; applications; numerical analysis; cohesionless materials; engineering geology; methods; finite element analysis; statistical methods; deformation; loading; elasticity; footings; stress

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984326 80-25924

The design of footings on cohesionless soil

Hamza, M.; Cronney, P.

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)

Witke, W.(EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A. A. Balkema

939-951p., 1979

28 REFS

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., tables

Descriptors: foundations; soil mechanics; design; applications; numerical analysis; cohesionless materials; engineering geology; methods; finite element analysis; statistical methods; loading; failure; plasticity; stress; deformation; mathematical models; breakwaters

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984325 80-25923

Higher order Winkler model for soil-structure interaction

Hall, J. R., Jr.; Constantopoulos, J. V.; Michalopoulos, A.

P. Stone & Webster Eng. Corp., Boston, Mass., USA

Numerical methods in geomechanics; Volume three, 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)

Witke, W.(EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A. A. Balkema

933-938p., 1979

6 REFS

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: soil mechanics; models; numerical analysis; engineering geology; methods; elasticity; stiff clay; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984323 80-25872

**Effect of foundation embedment on stress and deformation distributions**  
Durgunoglu, H. T.

**Numerical methods in geomechanics; Volume three. 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)**  
Wittke, W. (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema  
925-928p., 1979

4 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: foundations; design; numerical analysis; engineering geology; methods; stress; deformation; elasticity; finite element analysis; statistical methods; loading; soil mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984321 80-25798

**Strip load on strain softening clay foundation**  
Cavounidis, S. C.; Maistros, J. G.

**Numerical methods in geomechanics; Volume three. 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)**  
Wittke, W. (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

909-916p., 1979

10 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: foundations; automatic data processing; design; engineering geology; numerical analysis; methods; plasticity; clays; strain; elastoplastic materials; soil mechanics; mathematical models; models; stress; elasticity; finite element analysis; statistical methods; Young's modulus; elastic constants  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984320 80-25785

**Numerical methods in calculations of stressed-strained states and consolidation of earth structures and foundations**  
Bugrov, A. K.; Ivanov, P. L.

**Numerical methods in geomechanics; Volume three. 8. Soil-structure-interaction (foundations); 9. Soil-structure-interaction (retaining structures)**  
Wittke, W. (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

901-907p., 1979

10 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: foundations; design; numerical analysis; engineering geology; methods; dams; soil mechanics; elasticity; plasticity; deformation; loading; finite element analysis; statistical methods; creep; consolidation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984319 80-26229

Variational approach for the elimination of temporary boundary effect from finite element method

Uchi, K.; Sato, T.

Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics

Witte, W.(EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany. Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

889-897p., 1979

109 REFS.

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Plus.

Descriptors: engineering geology; methods; numerical analysis; rock mechanics; finite element analysis; statistical methods; earthquakes; mathematical models;

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984317 80-26127

Rock bursting; a nonlinear dynamic contact problem

Rammerstorfer, F. G.; Fischer, D. F.; Zitz, A.

Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics

Witte, W.(EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany. Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

871-878p., 1979

6 REFS.

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Plus.

Descriptors: engineering geology; methods; numerical analysis; stress; rock bursts; finite element analysis; statistical methods; Young's modulus; elastic constants; plasticity

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984316 80-25940

Transient response of fractured rock systems to fluid injection; a finite element study

Witber, H. M.; Taylor, R. L.; Witherspoon, P. A.

Univ. Calif., Berkeley, Calif., USA

Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics

Witte, W.(EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany. Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

855-870p., 1979

27 REFS.

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Plus.

Descriptors: waste disposal; methods; numerical analysis; engineering geology; rock mechanics; finite element analysis; statistical methods; fluid injection; stress

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

9R4312 80 25713

Comparison of finite element and lumped parameter modelling for seismic response of reactor building foundation systems

Arochitsamv, M.; Reddy, D. V.; Bobby, W.; Haldar, A. K.  
Mem Univ. of Newfoundland, St. John's, Newfoundland, CAN

Numerical methods in geomechanics; Volume two, 4. Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics

Witke, W. (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

817-829p., 1979

28 REFS.

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., tables

Descriptors: nuclear facilities; foundations; design; element analysis; engineering geology; methods; finite strain; elastoplastic materials; mathematical models; models; shear modulus; elastic constants  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

9R4310 80-25973

An analysis of progressive failure in rock slopes

Kawamoto, T.; Takeda, N.

Numerical methods in geomechanics; Volume two, 4. Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics

Witke, W. (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

797-808p., 1979

10 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., tables

Descriptors: slope stability; rock mechanics; numerical analysis; engineering geology; methods; embankments; soil mechanics; finite element analysis; statistical methods; plasticity; stress; strain; failure  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

9R4309 80-25858

Stability analysis of rock slopes with respect to statistical aspects

Deutsch, R. R.

Numerical methods in geomechanics; Volume two, 4. Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics

Witke, W. (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

791-795p., 1979

11 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., table

Descriptors: slope stability; rock mechanics; numerical analysis; engineering geology; methods; embankments; stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984307 80-26026

**Limit equilibrium for nonlinear failure envelope and arbitrary slip surface**  
Matsuyama, M.

**Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
759-777p., 1979

15 REFS.

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.  
Descriptors: slope stability; design; numerical analysis; engineering geology; methods; stress; triaxial tests; finite element analysis; statistical methods; shear stress; nonlinear analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984306 80-25930

**A method of slope stability analysis and design of slope by linear predictor**  
Masegawa, T.

**Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
759-767p., 1979

5 REFS.

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.  
Descriptors: slope stability; design; numerical analysis; engineering geology; methods; stress; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984305 80-25776

**STABL 2; a computer program for general slope stability analysis**

Bouttrup, E.; Lovell, C. W.; Siegel, R. A.  
Purdue Univ., West Lafayette, Indiana, USA; CH2M Hill, Boise, Idaho, USA

**Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
747-757p., 1979

7 REFS.

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.  
Descriptors: automatic data processing; slope stability; engineering geology; theoretical studies; circular failure; methods; numerical analysis; pore pressure; computer programs; soil mechanics; loading; failure; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984304 80-26294

Behaviour of an asphalt concrete core during dam construction and reservoir filling  
Zawon, J. W.

Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics

Witke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

733-740p., 1979

16 REFS

Subfile: B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.: table

Descriptors: dams; foundations; embankments;

engineering geology; methods; numerical analysis; slope

stability; stress; strain; creep; finite element analysis;

statistical methods; elasticity; plasticity; deformation;

triaxial tests

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984303 80-26221

Numerical analyses of embankments over soft soils

Thamm, P. R.

Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics

Witke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

725-731p., 1979

13 REFS

Subfile: B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: soil mechanics; theoretical studies;

deformation; engineering geology; methods; numerical

analysis; slope stability; mathematical models; materials;

stress; pore pressure; creep; strain; isotropic materials;

irreversibility; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984302 80-26170

Undrained behaviour of soft clay under embankment loading  
Sekiguchi, H.; Shibata, T.

Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics

Witke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

717-724p., 1979

14 REFS

Subfile: B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.: tables

Descriptors: slope stability; theoretical studies;

failure; engineering geology; methods; numerical analysis;

clays; soil mechanics; foundations; elastoplastic

materials; stress; strain; finite element analysis;

statistical methods; pore pressure

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984790 80-25834

**Underground stiffness and stress-strain behaviour of high embankments**  
Czapla, H.

**Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ A A Balkema  
699-708p. 1979

11 REFS

Subfile P

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English

illus.

Descriptors: slope stability; experimental studies; stress; engineering geology; methods; numerical analysis; stiff clay; strain; finite element analysis; statistical methods; triaxial tests

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984799 80-26237

**Interaction between tunnel openings due to vibration effects**  
Valliapan, S.; Chandrasekaran, V.; Lee, I. K.

**Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ A A Balkema

685-696p. 1979

8 REFS

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English

illus., table

Descriptors: tunnels; design; numerical analysis; engineering geology; methods; underground installations; finite element analysis; statistical methods; mathematical models; deformation

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984298 80-25990

**Numerical method on underground containment of fission products at a hypothetical accident in underground nuclear power plant**  
Komada, H.; Hayashi, M.

**Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A. A. Balkema

671-684p. 1979

16 REFS

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English

illus., tables

Descriptors: underground installations; nuclear facilities; design; pollution; numerical analysis; seepage; engineering geology; methods; rock mechanics; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984297 80-26176

Computation and analysis of probabilistic characteristics of stresses near underground opening in stochastically inhomogeneous rock mass  
Sheinin, V. I.

Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics

Witte, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A A Balkema  
663-662p . 1979  
18 REFS.

Subfile B

Country of Publ: Netherlands

Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

Descriptors: underground installations ; design ; numerical analysis ; engineering geology ; methods ; rock mechanics ; elasticity ; stress ; statistical analysis ; stochastic processes

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984295 80-25899

Viscoplastic finite element analysis of tunnel sections in grouted sand  
Gar tung, E.; Dubois, J.; Baumeifeld, P.

Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics

Witte, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A A Balkema  
639-647p . 1979  
6 REFS

Subfile B

Country of Publ: Netherlands

Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

Descriptors: tunnels ; design ; numerical analysis ; engineering geology ; methods ; underground installations ; finite element analysis ; statistical methods ; elastoplastic materials ; stress ; strain ; failure

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984296 80-26155

A design approach to dimensioning underground openings

Sakurai, S ; Ate, S

Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics

Witte, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A A Balkema  
649-661p . 1979  
4 REFS

Subfile B

Country of Publ: Netherlands

Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

illus: table

Descriptors: underground installations ; design ; numerical analysis ; engineering geology ; methods ; rock mechanics ; elasticity ; elastoplastic materials ; stress ; tunnels ; plasticity ; finite element analysis ; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984294 80-25893

**Annular rock caverns for energy storage under Fourier expandable stress fields**

Fuh, G. F.; Haimson, B. C.; Lapointe, P. R.; Univ Wisconsin, Dep Metall. and Min. Eng., Madison, Wisc., USA

engineering geology; methods; underground installations; stress; strain; finite element analysis; statistical methods; plasticity; elasticity

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984291 80-25694

**Tunneling in fully-saturated soft sedimentary rocks**

Adachi, T.; Mochida, Y.; Yamura, T.

**Numerical methods in geomechanics; Volume two, 4. Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A. A. Balkema

599-610p., 1979

6 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: tunnels; rock mechanics; design;

theoretical studies; numerical analysis; deformation;

engineering geology; methods; underground installations;

creep; stress; plasticity; cyclic loading; triaxial tests;

strain; pore pressure; finite element analysis;

statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984292 80-25774

**Influence of the strain-softening behaviour of rock masses on the stability of a tunnel**

Rorsetto, M.; Ribacchi, R.

**Numerical methods in geomechanics; Volume two, 4. Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A. A. Balkema

627-638p., 1979

34 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.; table

Descriptors: underground installations; rock mechanics;

design; theoretical studies; numerical analysis;

deformation; engineering geology; methods; finite element

analysis; statistical methods; shear modulus; elastic

constants; tunnels; mathematical models; stress;

failure; Fourier analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Influence of the strain-softening behaviour of rock masses on the stability of a tunnel**

Rorsetto, M.; Ribacchi, R.

**Numerical methods in geomechanics; Volume two, 4. Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ: A. A. Balkema

611-620p., 1979

15 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: tunnels; rock mechanics; design;

theoretical studies; numerical analysis; deformation;

984290 80-26251

**New Austrian tunneling method and finite elements**  
Wanninger, R

**Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics**

Witke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
587-597p., 1979  
12 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English

illus.  
Descriptors: tunnels; rock mechanics; design; theoretical studies; numerical analysis; deformation; engineering geology; methods; finite element analysis; statistical methods; soil mechanics; stress; underground installations; rock anchors  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984287 80-25866

**The influence of construction work sequence on the stability of underground openings**  
Dolezalova, M.

**Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics**

Witke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
561-570p., 1979  
13 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English

illus.  
Descriptors: underground installations; rock mechanics; design; theoretical studies; rock anchors; deformation; engineering geology; methods; numerical analysis; stress; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984289 80-26211

**Finite element analysis of the new Austrian tunneling method (NATM)**  
Swoboda, G.

**Numerical methods in geomechanics; Volume two, 4, Rock behavior; 5, Underground openings; 6, Embankments and slopes; 7, Dynamics**

Witke, W (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
581-586p., 1979  
8 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English

illus.  
Descriptors: tunnels; design; numerical analysis; engineering geology; methods; finite element analysis; statistical methods; elasticity; plasticity; mathematical models; stress; soil mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984286 80-26096

**A finite element approach to strain softening and size effects in rock mechanics**

Parisod, W. G.  
Univ. Utah, Salt Lake City, Utah, USA

**Numerical methods in geomechanics; Volume two, 4. Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics**

Wittke, W. (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

545-558p., 1979

17 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Illustr.: illu.

Descriptors: rock mechanics; theoretical studies; deformation; methods; numerical analysis; finite element

analysis; statistical methods; strain; stress; triaxial

tests; plasticity; failure

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984284 80-25948

**Non-linear analysis of the mechanical properties of joint and weak intercalation in rock**

Hsu-Jun, K.

**Numerical methods in geomechanics; Volume two, 4. Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics**

Wittke, W. (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

523-532p., 1979

10 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Illustr.: illu.

Descriptors: rock mechanics; theoretical studies; deformation; engineering geology; methods; numerical

analysis; stress; mathematical models; models; finite

element analysis; statistical methods; nonlinear analysis;

mechanical properties

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984283 80-25868

**Efficient three dimensional finite element analysis of stratified rocks**

Dubois, J.; Obenaus, P. W.

**Numerical methods in geomechanics; Volume two, 4. Rock behavior; 5. Underground openings; 6. Embankments and slopes; 7. Dynamics**

Wittke, W. (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema

515-522p., 1979

9 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Illustr.: tables

Descriptors: rock mechanics; models; numerical analysis

; engineering geology; methods; finite element analysis;

statistical methods; deformation; elastoplastic materials;

plasticity; elasticity; three-dimensional models; layered

materials

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984282 80 250827

**Finite element analysis of stress distribution, induced fracture and post-failure behaviour along a shear zone in rock**  
 (Copr. W. Wunderlich, W. Kutter, H. K. Rahn, W.

**Numerical methods in geomechanics; Volume two. 4. Rock behavior. 5. Underground openings; 6. Embankments and slopes; 7. Dynamics**

Witte, W. (EDITOR)  
 Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
 493 502P : 1979  
 5 PFS

Subtitle B  
 Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
 Illustrations

Descriptors: soil mechanics; models; numerical analysis; engineering geology; methods; finite element analysis; statistical methods; stress; failure; deformation; shear modulus; elastic constants; strain  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984283 80 25083

**The application of finite elements to creep problems in ground freezing**  
 Klein, J.

**Numerical methods in geomechanics; Volume one. 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witte, W. (EDITOR)  
 Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
 493 502P : 1979  
 1 PFS

Subtitle B  
 Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
 Illustrations

Descriptors: soil mechanics; permafrost; models; foundations; numerical analysis; finite element analysis; engineering geology; methods; statistical methods; creep; strain; stress; frozen ground; soils; tunnels; underground installations; constitutive equations  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984279 80 26083

**Constitutive equations considering anisotropy and stress reorientation in clay**  
 Ohba, H.; Sekiguchi, H.

**Numerical methods in geomechanics; Volume one. 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witte, W. (EDITOR)  
 Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
 475 484P : 1979  
 1 PFS

Subtitle B  
 Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
 Illustrations

Descriptors: soil mechanics; models; numerical analysis; engineering geology; methods; stress; clays; anisotropy; information; plasticity; strain; finite element analysis; statistical methods; pore pressure; constitutive equations  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

equations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984267 80-26036

**Incremental non-linear stress-strain relationship for soil and integration by finite element method**  
Chamberlain, R. ; Renaud Lias, B.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**  
Witke, W (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of. April 2-6, 1979  
Publ. A. A. Balkema  
4:05.413p. 1979  
ISBN 9061910404 16 REFS.  
Subfile B  
Country of Publ.: Netherlands  
Doc Type BOOK: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
illus.

Descriptors: soil mechanics; models; numerical analysis; engineering geology; methods; finite element analysis; statistical methods; stress; strain; triaxial tests; nonlinear analysis; constitutive equations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984268 80-26117

**Mathematical modeling of soil stress-strain-strength behavior**  
Pie, Ost, J. H.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**  
Witke, W (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of. April 2-6, 1979  
Publ. A. A. Balkema  
347-761p. 1979  
ISBN 9061910404 13 REFS.  
Subfile B  
Country of Publ.: Netherlands  
Doc Type BOOK: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
illus. tables

Descriptors: soil mechanics; theoretical studies; cyclic loading; engineering geology; methods; numerical analysis; mathematical models; models; elastoplastic materials; stress; strain; plasticity; flow; elasticity; cohesionless materials; cohesive materials; triaxial tests; finite element analysis; statistical methods; constitutive

**A survey of the methods to calculate safety against collapse in soil and rock masses**  
Martins, J. B. ; Matos, A. C.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**  
Witke, W (EDITOR)

Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of. April 2-6, 1979  
Publ. A. A. Balkema  
339-346p. 1979  
ISBN 9061910404 41 REFS.  
Subfile B  
Country of Publ.: Netherlands  
Doc Type BOOK: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
illus.

Descriptors: soil mechanics; theoretical studies; collapsible materials; engineering geology; methods; numerical analysis; finite element analysis; statistical methods; elastoplastic materials; porous materials; deformation; pore pressure; mathematical models; stress; strain; constitutive equations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984261 89 2591R

**A constitutive law of the rate type for soils**

Gubbins, W. J. Polymers, D.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W. (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

719-329p, 1979

ISBN 9061910404 14 REFS.

Subfile B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: soil mechanics; theoretical studies; consolidation; engineering geology; methods; numerical analysis; stress; strain; plasticity; deformation; finite element analysis; statistical methods; triaxial tests; creep; clay; constitutive equations

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984262 89 2583R

**The development of constitutive laws for soil using the distinct element method**

Giambelli, P. A.; Strack, O. D. L.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W. (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

282-208p, 1979

ISBN 9061910404 14 REFS.

Subfile B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: soil mechanics; models; numerical analysis; engineering geology; methods; stress; strain; mathematical models; finite element analysis; statistical methods; granular materials; constitutive equations

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984261 80 25726

**Numerical algorithm for an elastoplastic constitutive equation with two yield surfaces**

Aubry, D.; Des Croix, P.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W. (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

283-288p, 1979

ISBN 9061910404 9 REFS.

Subfile B

Country of Publ.: Netherlands

Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: engineering geology; methods; numerical analysis; elasticity; plasticity; finite element analysis; statistical methods; stress; cyclic loading; constitutive equations

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984260 80-26275

**Finite element analysis of heat and moisture transfer in unsaturated soils**  
Yanagisawa, E.; Tanaka, M.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
275-280p., 1979  
ISBN: 9061910404 11 REFS.

Subtitle: B  
Country of Publ.: Netherlands  
Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Descriptors: \*soil mechanics; models; numerical analysis  
\*embankments; \*slope stability; \*seepage; \*failure; \*engineering geology; methods; finite element analysis;  
\*statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984259 80-25979

**Numerical simulation of the compaction-subsideance phenomena in a reservoir for two-phase nonisothermal flow conditions**  
Ertokulu, I.; Farouq Ali, S. M.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
263-270p., 1979  
ISBN: 9061910404 13 REFS.

Subtitle: B  
Country of Publ.: Netherlands  
Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Descriptors: \*reservoirs; design; numerical analysis; engineering geology; methods; mathematical models; models; subsidence; underground installations; pore pressure; rock mechanics; deformation; elasticity; finite element analysis  
\*statistical methods; simulation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984258 80-25974

**Numerical modeling of seepage in earth and rockfill dams**  
Kazda, I.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema  
257-261p., 1979  
ISBN: 9061910404 6 REFS.

Subtitle: B  
Country of Publ.: Netherlands  
Doc. Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Descriptors: \*dams; \*slope stability; \*seepage; \*embankments; numerical analysis; failure; engineering geology; methods; soil mechanics; mathematical models; models; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984257 80-25807

**Time-space finite elements for unsaturated flow through porous media**  
Cheung, V. K.; Tham, L. G.

**Numerical methods in geomechanics; Volume one. 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of. April 2-6, 1979

Publ. A. A. Balkema  
251-256p., 1979  
ISBN 9061910404 11 REFS

Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC

Languages: English  
illus., tables  
Descriptors: engineering geology; methods; numerical analysis; finite element analysis; statistical methods; statistical analysis; porous media  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984256 80-25697

**Coupled stress flow analysis in saturated-unsaturated medium by finite element method**  
Akai, K.; Ohnishi, Y.; Murakami, T.; Horita, M.

**Numerical methods in geomechanics; Volume one. 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of. April 2-6, 1979

Publ. A. A. Balkema  
241-249p., 1979  
ISBN 9061910404 13 REFS

Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC

Languages: English  
illus.  
Descriptors: soil mechanics; theoretical studies; consolidation; engineering geology; methods; numerical analysis; finite element analysis; statistical methods; pore pressure; stress; strain; seepage; rock mechanics; porosity; permeability; flow  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984255 80-25698

**Finite element analysis of three-dimensional flows in saturated-unsaturated soils**  
Akai, K.; Ohnishi, Y.; Nishigaki, M.

**Numerical methods in geomechanics; Volume one. 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Wittke, W. (EDITOR)  
Third international conference on numerical methods in geomechanics. Aachen, Germany, Federal Republic of. April 2-6, 1979

Publ. A. A. Balkema  
227-239p., 1979  
ISBN 9061910404 21 REFS

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC

Languages: English  
illus.  
Descriptors: soil mechanics; theoretical studies; permeability; engineering geology; methods; numerical analysis; finite element analysis; statistical methods; seepage; flow; porosity  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984254 80-26195

**Numerical methods for the settlement of Venice and layered soil deposits**

Sparks, A. D. W.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W. (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

213-225p., 1979

ISBN: 9061910404 30 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., sketch maps

Descriptors: Italy; engineering geology; land subsidence; methods; numerical analysis; soil mechanics; Europe; no river; pore pressure; artesian waters; finite element analysis; statistical methods; mathematical models; models; aquifers; stress; triaxial tests; strain; permeability; settlement; foundations

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984253 80-26187

**Analysis of the consolidation of layered soils using the method of lines**

Small, J. C.; Ranker, J. R.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W. (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

201-211p., 1979

ISBN: 9061910404 16 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., table

Descriptors: soil mechanics; theoretical studies; consolidation; engineering geology; methods; numerical analysis; elastoplastic materials; finite element analysis; statistical methods; pore pressure; permeability; strain

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984252 80-26154

**Numerical model for undrained and consolidation deformations of soft clays**

Sagseta, C.; Gallester, F.; Salnz, U. A.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W. (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

191-200p., 1979

ISBN: 9061910404 14 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., table

Descriptors: soil mechanics; theoretical studies; consolidation; engineering geology; methods; numerical analysis; deformation; clays; mathematical models; models; foundations; strain; pore pressure; stress; plastic materials; finite element analysis; statistical methods; soft soils

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984251 80-25142

**Nonlinear consolidation models for finite element computations**  
Richter, T.

**Numerical methods in geomechanics; Volume one. 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witte, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema  
181-190p., 1979  
ISBN: 9061910404 14 REFS.

Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: soil mechanics; theoretical studies; consolidation; engineering geology; methods; numerical analysis; finite element analysis; statistical methods; mathematical models; foundations; deformation; stress; strain; plasticity; elasticity; nonlinear analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984247 80-25855

**A one-dimensional finite element procedure for nonlinear consolidation**

Desai, C. S.; Kuppuramy, T.; Koutsoftas, D. C.; Janardhanam, R.

**Numerical methods in geomechanics; Volume one. 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witte, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema  
143-149p., 1979  
ISBN: 9061910404 19 REFS

Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: soil mechanics; models; numerical analysis; engineering geology; methods; finite element analysis; statistical methods; stress; strain; pore pressure; nonlinear analysis; consolidation

984246 80-25727

**Special algorithms for elastoplastic consolidation with finite elements**

Aubry, D.; Hujeux, J. C.

**Numerical methods in geomechanics; Volume one. 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witte, W. (EDITOR)  
Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ.: A. A. Balkema  
132-141p., 1979  
ISBN: 9061910404 11 REFS.

Subfile B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: soil mechanics; models; numerical analysis; engineering geology; methods; elasticity; finite element analysis; statistical methods; algorithms; flow; elastoplastic materials; pore pressure; cyclic loading; consolidation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984243 80-26257

**Techniques in user oriented finite element programs for  
geomechanical design practice**

Weiner, H.; Arhousen, K.; Katz, C.

**Numerical methods in geomechanics; Volume one, 1.  
Theoretical developments; 2. Flow and consolidation; 3.  
Constitutive laws**

Wittke, W (EDITOR)  
Third international conference on numerical methods in  
geomechanics, Aachen, Germany, Federal Republic of, April  
2-6, 1979

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103-111p., 1979

ISBN 9061910404 10 REFS.

Subfile B

Country of Pub: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English

illus

Descriptors: engineering geology; automatic data  
processing; methods; numerical analysis; design; finite  
element analysis; statistical methods; computer programs  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984241 80-26214

**A relaxation stress-deformation finite element program**

Šavits Norman, A.; Kovacic, D.

**Numerical methods in geomechanics; Volume one, 1.  
Theoretical developments; 2. Flow and consolidation; 3.  
Constitutive laws**

Wittke, W (EDITOR)  
Third international conference on numerical methods in  
geomechanics, Aachen, Germany, Federal Republic of, April  
2-6, 1979

Publ: A. A. Balkema

89-91p., 1979

ISBN 9061910404 4 REFS.

Subfile E

Country of Pub: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English

illus

Descriptors: engineering geology; methods; numerical  
analysis; finite element analysis; statistical methods;  
deformation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984240 80-26132

**Three-dimensional continuum-finite element formulation for  
dynamic impedance evaluation of arbitrarily shaped foundations**  
Ray, D.

**Numerical methods in geomechanics; Volume one, 1.  
Theoretical developments; 2. Flow and consolidation; 3.  
Constitutive laws**

Wittke, W (EDITOR)

Third international conference on numerical methods in  
geomechanics, Aachen, Germany, Federal Republic of, April  
2-6, 1979

Publ: A. A. Balkema

77-88p., 1979

ISBN 9061910404 8 REFS.

Subfile: B

Country of Pub: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English

illus

Descriptors: foundations; models; numerical analysis;  
engineering geology; methods; finite element analysis;  
statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984239 80 26110

**Three-dimensional geometric and material nonlinearities analysis of some problems in geomechanics**

Witke, W (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

67 75p., 1979

ISBN 9061910404 17 REFS.

Subfile B

Country of Publ. Netherlands

Doc Type BOOK; CONFERENCE PUBLICATION Bibliographic

Level ANALYTIC

Languages English

illus.

Descriptors: engineering geology; methods; numerical analysis; foundations; piles; anchors; finite element analysis; statistical methods; plasticity; underground installations; tunnels  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984274 80 25815

**On tractable constitutive relations and numerical procedures for structural analysis in masses of geological materials**

Clear, M. P.; Bathur, K. J.

**Numerical methods in geomechanics; Volume one, 1. Theoretical developments; 2. Flow and consolidation; 3. Constitutive laws**

Witke, W (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

15 29p., 1979

ISBN 9061910404 43 REFS.

Subfile B

Country of Publ. Netherlands

Doc Type BOOK; CONFERENCE PUBLICATION Bibliographic

Level ANALYTIC

Languages English

illus.

Descriptors: engineering geology; methods; numerical analysis; rock mechanics; finite element analysis; statistical methods  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984232 80 25662

**Numerical methods in geomechanics; proceedings of the Third international conference on numerical methods in geomechanics**

Witke, W (EDITOR)

Third international conference on numerical methods in geomechanics, Aachen, Germany, Federal Republic of, April 2-6, 1979

Publ. A. A. Balkema

1252p., 1979

ISBN 9061910404 Ed. 3

Subfile B

Country of Publ. Netherlands

Doc Type BOOK; CONFERENCE PUBLICATION Bibliographic

Level COLLECTIVE

Languages English

Note In three

volumes; individual articles are cited separately. illus.

Descriptors: symposia; engineering geology; numerical analysis; rock mechanics; statistical analysis  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

984644 80 25669

**Resilient based flexible pavement design procedure for secondary roads**

Figueroa, J. L.

Univ. of Illinois, Urbana, Ill., USA

334p., 1979

Subfile B

Degree Level Doctoral

Country of Publ. United States

Doc Type THESIS Bibliographic Level: MONOGRAPHIC

Languages English

Availability Univ. Microfilms  
Descriptors: soil mechanics; highways; elasticity; materials; properties; elastic properties; pavement design; flexibility; loading; theoretical studies; mathematical models; models; automatic data processing; engineering geology; finite element analysis; statistical methods; stress; failure; computer programs; ILLI-PAVE; shear strength; materials; properties  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

983612 80-25667

**Prediction and statistical analysis of settlements of shallow foundations on sand**

Elbaz, M R  
Univ. of Pittsburgh, Pittsburgh, Pa., USA  
151p., 1979

Subfile B

Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESES Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: soil mechanics; foundations; settlement; prediction; sand; elastic settlements; statistical analysis; mathematical models; design; elasticity  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

983640 80-25663

**An integrated study of a wastewater disposal plan**

Alshar, A.  
Univ. of California, Davis, Calif., USA  
211p., 1977

Subfile B

Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESES Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: California; Longitude: W1220000; W1230000  
disposal; Sonoma County; United States; Central California; San Francisco Bay region; liquid waste; waste water; statistical analysis; automatic data processing  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

983614 80-25673

**Prediction of the geotechnical properties of late Quaternary Mississippi Delta deposits**

Helwick, S. J., Jr.  
Texas A&M Univ., College Station, Tex., USA  
239p., 1979

Subfile B

Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESES Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Latitude: N280000; N290000 Longitude: W0883000; W0890000  
Descriptors: Louisiana; soil mechanics; Gulf of Mexico; Gulf coastal plain; sediments; engineering geology; materials; properties; marine installations; mechanical

properties; upper Quaternary; United States; United States; Mississippi Delta; offshore; North America; deltas; engineering properties; statistical analysis; shear strength; grain size; clays; foundations; piles; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

983244 80-25770

**Peak acceleration, velocity, and displacement from strong-motion records**

Roore, D. M.; Joyner, W. B.; Oliver, A. A., III; Page, R. A.  
U. S. Geol. Surv., Menlo Park, Calif., USA  
Seismol. Soc. Am., Bull., 70, 1, 305-321p., 1980  
CODFN, BSSAAP ISSN: 0037-1106 28 REFS

Subfile B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Latitude: N300000; N650000 Longitude: W1000000; W1600000  
Descriptors: North America; California; seismology; engineering geology; earthquakes; geologic hazards; strong motion; United States; accelerograms; ground motion; magnitude; displacements; statistical analysis; structures  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

982769 RU 26252

**Fracture leakage in Cretaceous shales and its significance for underground waste disposal**

Newell, F. B. and Bredemeyer, J. D.  
U. S. Geol. Surv., Reston, Va., USA  
The Geological Society of America, 92nd annual meeting,  
San Diego, Calif., United States, Nov. 5 B, 1979  
Geol. Soc. Am., Abstr. Programs 11 7, 486p., 1979  
(CODEN GAARBC ISSN 0016 7592)

Country of Publ. United States  
Doc. Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
Latitude N40000, W100000 Longitude W950000, W1200000  
Descriptors Western Interior; ground water; fractures; engineering geology; surveys; distribution; waste disposal; Cretaceous; Pierre Shale; Dakota Formation; contamination; elastic modulus; North America; aquifers; radioactive waste; storage; rocks; statistical analysis; radioactivity; underground installations  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

982770 CO 26252

**Statistical characterization of rock crack patterns**

Warren, M. Warren, M. and Tiffney, W.  
Univ. Calif., Inst. Geophys. and Planet. Phys., Los Angeles, Calif., USA  
American Geophysical Union, 1979 fall annual meeting, San Francisco, Calif., United States, Dec 3 7, 1979  
Eos (Am. Geophys. Union Trans.) 60 46, 933p., 1979  
(CODEN EOSTAU ISSN 0096 3941)

Country of Publ. United States  
Doc. Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
Latitude N40000, W100000 Longitude W0710500, W0711500  
Descriptors rock mechanics; deformation; cracks; Carroll County; fracture; distribution; ultrastructure; elastic properties; granite; granite-granodiorite family; New Hampshire; United States; White Mountains  
Statistical methods  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

982771 RU 26226

**Characterization and similarity testing of the mechanical properties of rocks**

Warren, M. Warren, M.  
Univ. Calif., Inst. Geophys. and Planet. Phys., Los Angeles, Calif., USA

American Geophysical Union; 1979 fall annual meeting, San Francisco, Calif., United States, Dec. 3-7, 1979  
Eos (Am. Geophys. Union Trans.) 60 46, 939p., 1979  
(CODEN EOSTAU ISSN 0096 3941)

Country of Publ. United States  
Doc. Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages English  
Latitude N435000 Longitude W0710500; W0711500  
Descriptors rock mechanics; materials; properties; mechanical properties; Carroll County; materials; properties; elastic properties; cluster analysis; statistical methods; ultrastructure; granite; granite-granodiorite family; cores; indicators; textures; quantitative methods; New Hampshire; United States; Conway; White Mountains  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

981442 80-21240

**Variable modulus model for inelastic finite element analysis**

Al-Shawaf, T. D.  
Univ. of California, Berkeley, Calif., USA  
141p., 1979  
Subfile B  
Degree Level: Doctoral  
Country of Publ. United States  
Doc. Type THESES Bibliographic Level: MONOGRAPHIC  
Languages English  
Availability: Univ. Microfilms  
Descriptors automatic data processing; soil mechanics; engineering geology; theoretical studies; models; mathematical models; finite element analysis; statistical methods; strain; shear strength; engineering properties  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

981102 80-21776

**Discriminant analysis as a possible tool in landslide investigations**

Repp, J. P.  
Cleveland State Univ., Dep. Geol. Sci., Cleveland, Ohio, USA  
Environ. Syst. Process. 4, 3, 267-273p., 1979  
CODEN: ESPTD7 ISSN: 0160-1269 15 REFS.  
Subfile 5  
Country of Publ.: United Kingdom  
Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, block diag.  
Descriptors: West Virginia; geomorphology; mass movements; landslides; slope stability; failure; engineering; geology; soil mechanics; prediction; statistical analysis; mine spoils; discriminant analysis; mathematical methods  
Section Headings: 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

981109 80-21565

**On joint/interface elements and associated problems of numerical ill-conditioning**

Chak, G. N.; Ghama, K. G.  
Int. J. Numer. Anal. Methods Geomech. 3, 3, 293-306p., 1979  
10 REFS.  
Subfile 6  
Country of Publ.: International  
Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: engineering geology; methods; finite element analysis; mathematical models; models; statistical methods; joint elements; interface elements; mathematical geology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

981102 80-21600

**Elastic-plastic analysis of geotechnical problems by mathematical programming**

Chak, G. N.; Ghama, K. G.  
Int. J. Numer. Anal. Methods Geomech. 3, 4, 381-401p., 1979  
23 REFS.  
Subfile 6  
Country of Publ.: International  
Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: soil mechanics; rock mechanics; materials; mathematical analysis; elastoplastic materials; numerical analysis;

981101 80-21286

**Optimal lower bound of passive earth pressure using finite elements and non-linear programming**

Basudhar, P. K.; Valsangkar, A. J.; Madhav, M. R.  
Int. J. Numer. Anal. Methods Geomech. 3, 4, 367-379p., 1979  
6 REFS.  
Subfile 8  
Country of Publ.: International  
Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: soil mechanics; earth pressure; finite element analysis; statistical methods; plasticity; Mohr-Coulomb law; loading; numerical analysis; stress; bearing capacity  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

980400 80-21327

**Diffusion analogy for some stress computations**

Chakwandi, S. C.; Alimba, M.  
Am. Soc. Civ. Eng., Proc., J. Geotech. Eng. Div. 105, GI11, 1337-1342p., 1979  
5 REFS.  
CODEN: AUGEB6 ISSN: 0093-6405  
Subfile 8  
Country of Publ.: United States  
Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: soil mechanics; methods; statistical methods; diffusion; stress; granular materials  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

AD-A136 355

COMPENDIUM OF ABSRACTS ON STATISTICAL APPLICATIONS IN  
GEOTECHNICAL ENGIN..(U) ARMY ENGINEER WATERWAYS  
EXPERIMENT STATION VICKSBURG MS GEOTE..

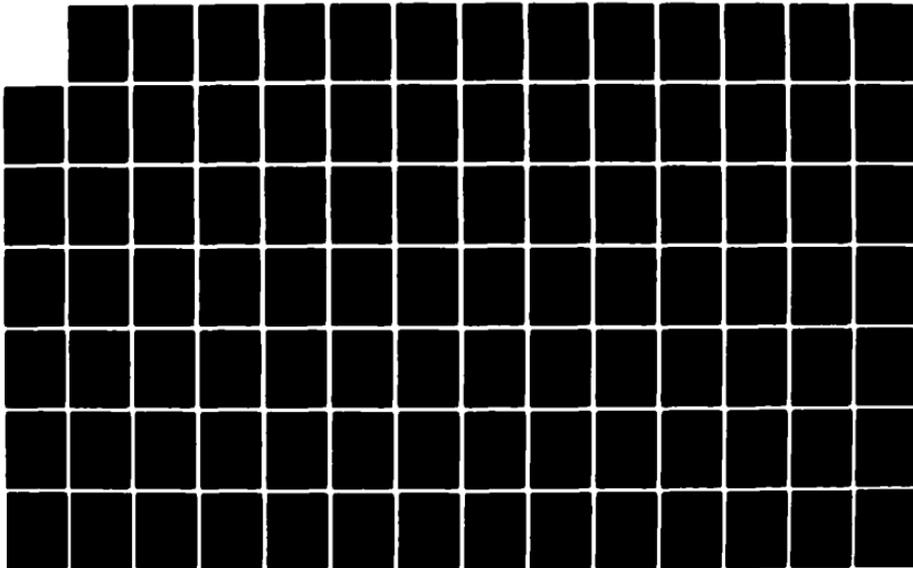
56

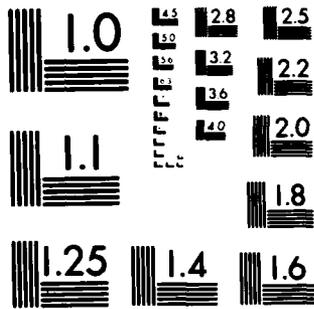
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M E HYNES-GRIFFIN ET AL. SEP 83

F/G 13/2

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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

980480 80-21396

**Pore distribution and permeability of silty clays**  
 Garcia-Ruogochea, I.; Lovell, C. W.; Altschaeffl, A. G.  
 Geotech. Eng., Portland, Oreg., USA; Purdue Univ., Dep. Civ. Eng., USA  
 Am. Soc. Civ. Eng., Proc., J. Geotech. Eng. Div. 105: GT7, 839-856p., 1979  
 CODEN: AIGEB6 ISSN: 0093-6405 39 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*soil mechanics; \*experimental studies; permeability; clay; \*clastic sediments; compaction; porosity; size distribution; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

980472 80-21642

**Probabilistic evaluation of penetration resistances**  
 Tang, W. H.; Urbana-Champaign, Dep. Civ. Eng., Urban, Ill., USA  
 Am. Soc. Civ. Eng., Proc., J. Geotech. Eng. Div. 105: GT10, 1173-1189p., 1979  
 CODEN: AIGEB6 ISSN: 0093-6405 7 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table  
 Descriptors: \*soil mechanics; \*marine installations; methods; construction; penetration; gravity platforms; offshore; marine platforms; statistical analysis; site exploration; design; mathematical models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

980463 80-21296

**Probabilistic procedures for peak ground motions**  
 Blume, J. A.; Kiremidjian, A. S.  
 Am. Soc. Civ. Eng., Proc., J. Struct. Div. 105: ST11, 2293-2309p., 1979  
 CODEN: JSDEAG 24 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, sketch map  
 Latitude: N340000; N380000 Longitude: W1190000; W1230000  
 Descriptors: California; engineering geology; nuclear facilities; earthquakes; ground motion; statistical methods

; seismic risk; site exploration; United States; evaluation; faults; frequency; mathematical models; models Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

979777 80-21354

**Finite element analysis of seismic soil-structure interaction effects for nuclear power plants**  
 Dezfoulian, H.

**CENTO seminar on recent advances in earthquake hazard minimization**  
 Kisiiali, A. S. (EDITOR)  
 CENTO seminar on recent advances in earthquake hazard minimization, Tehran, Nov., 1976  
 CENTO Sci. Rep. 27, 284-299p., 1976  
 18 REFS.  
 Subfile: B

Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., charts

Descriptors: \*nuclear facilities; seismic response; design; seismic risk; structures; mathematical models; models; finite element analysis; statistical methods; soil mechanics; three-dimensional models; two-dimensional models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 979776 80-21678  
**Seismic analysis and design of nuclear power plant structures**  
 Varner, P. I.; Jhaveri, D. P.  
 CEMO seminar on recent advances in earthquake hazard minimization  
 Kisiati, A. S. (EDITOR)  
 CEMO seminar on recent advances in earthquake hazard minimization. Tehran, Nov., 1976  
 CEMO Sci. Rep. 27. 246-283p., 1976  
 32 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: United States; engineering geology; nuclear facilities; earthquakes; design; structures; seismic risk; stress; spectral analysis; soil mechanics; deformation; stress; finite element analysis; statistical methods; mathematical models; models; seismic response  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 978761 80-21656  
**Recent status of earthquake prediction research in Taiwan**  
 Tsai, Y. B.  
 Advisory meeting on earthquake engineering and landslides Z. (chairperson); Sheng-Taur, M. (chairperson); Yang, Z. (chairperson)  
 Advisory meeting on earthquake engineering and landslides. Taipei, Taiwan, Province of, 29 Aug.-2 Sep. '77  
 336p., 1977  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: earthquakes; prediction; methods; Taiwan; Asia; engineering geology; statistical analysis; zoning; plate tectonics  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 978746 80-21450  
**Strong earthquake ground motion**  
 Jennings, P. C.  
 Cal. Inst. Tech., Dep. Appl. Mech., Pasadena, Calif., USA
- 979776 80-21678  
**Seismic analysis and design of nuclear power plant structures**  
 Varner, P. I.; Jhaveri, D. P.  
 CEMO seminar on recent advances in earthquake hazard minimization  
 Kisiati, A. S. (EDITOR)  
 CEMO seminar on recent advances in earthquake hazard minimization. Tehran, Nov., 1976  
 CEMO Sci. Rep. 27. 246-283p., 1976  
 32 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: United States; engineering geology; nuclear facilities; earthquakes; design; structures; seismic risk; stress; spectral analysis; soil mechanics; deformation; stress; finite element analysis; statistical methods; mathematical models; models; seismic response  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 978761 80-21656  
**Recent status of earthquake prediction research in Taiwan**  
 Tsai, Y. B.  
 Advisory meeting on earthquake engineering and landslides Z. (chairperson); Sheng-Taur, M. (chairperson); Yang, Z. (chairperson)  
 Advisory meeting on earthquake engineering and landslides. Taipei, Taiwan, Province of, 29 Aug.-2 Sep. '77  
 336p., 1977  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: earthquakes; prediction; methods; Taiwan; Asia; engineering geology; statistical analysis; zoning; plate tectonics  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 978746 80-21450  
**Strong earthquake ground motion**  
 Jennings, P. C.  
 Cal. Inst. Tech., Dep. Appl. Mech., Pasadena, Calif., USA
- 978534 80-21198  
**Hydrology**  
 Nagy, I. V.  
 International post-graduate course on the principles and methods of engineering geology  
 Konda, J. (director)  
 Publ.: Hung. Geol. Inst. UNESCO  
 4. 195p., 1975  
 15 REFS.  
 Subfile: B  
 Country of Publ.: France  
 Doc Type: BOOK; Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 illus., tables  
 Descriptors: hydrology; education; cycles; engineering geology; evaporation; rock mechanics; hydrogeology; water resources; precipitation; dams; reservoirs; flow regime; economics; environmental geology; hydraulics; water supply; statistical analysis; land use  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 978534 80-21198  
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 Publ.: Hung. Geol. Inst. UNESCO  
 4. 195p., 1975  
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 Country of Publ.: France  
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 Konda, J. (director)  
 Publ.: Hung. Geol. Inst. UNESCO  
 4. 195p., 1975  
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 Country of Publ.: France  
 Doc Type: BOOK; Bibliographic Level: MONOGRAPHIC  
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- 978534 80-21198  
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 Nagy, I. V.  
 International post-graduate course on the principles and methods of engineering geology  
 Konda, J. (director)  
 Publ.: Hung. Geol. Inst. UNESCO  
 4. 195p., 1975  
 15 REFS.  
 Subfile: B  
 Country of Publ.: France  
 Doc Type: BOOK; Bibliographic Level: MONOGRAPHIC  
 Languages: English  
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 Descriptors: hydrology; education; cycles; engineering geology; evaporation; rock mechanics; hydrogeology; water resources; precipitation; dams; reservoirs; flow regime; economics; environmental geology; hydraulics; water supply; statistical analysis; land use  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978305 80 21332

**Two- and three-dimensional dynamic analysis**  
 Christian, J. T.; Roesset, J. M.; Desai, C. S.  
 Stone & Webster Eng. Corp., Boston, Mass., USA; Mass. Inst.  
 Technol., USA

**Numerical methods in geotechnical engineering**  
 Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
 Publ.: McGraw-Hill Book Co.  
 683-718p., 1977  
 ISBN: 0070165424 25 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English

Illustrations: tables  
 Descriptors: \*engineering geology; materials; properties  
 : dynamic properties; materials; properties; two-dimensional  
 models; models; three-dimensional models; elastic materials  
 : foundations; soil mechanics; rock mechanics; linear  
 materials; earthquakes; effects; frequency domain; damping  
 : nonlinear materials; wave trains; examples; finite  
 element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978304 80-21599

**Soil amplification of earthquakes**  
 Roesset, J. M.  
 Mass. Inst. Technol., Dep. Civ. Eng., Cambridge, Mass., USA

**Numerical methods in geotechnical engineering**  
 Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
 Publ.: McGraw-Hill Book Co.  
 639-692p., 1977  
 ISBN: 0070165424 27 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 Illustrations: tables  
 Descriptors: \*earthquakes; \*soil mechanics; effects  
 : materials; properties; dynamic properties; amplification  
 amplitude; frequency; ground motion; wave equation  
 analysis; three-dimensional models; models; linear  
 materials; SH-waves; layered materials; homogeneous media  
 : elastic materials; Fourier analysis; accelerograms  
 response; finite difference analysis; mathematical models  
 : finite element analysis; statistical methods; materials  
 properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978303 80-21674

**Static analysis for underground openings in jointed rock**  
 Witke, W.

**Numerical methods in geotechnical engineering**  
 Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
 Publ.: McGraw-Hill Book Co.  
 589-638p., 1977  
 ISBN: 0070165424 19 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 Illustrations: tables, sections, block diagrams  
 Descriptors: \*tunnels; \*rock mechanics; construction  
 : applications; joints; fractures; discontinuities; stress  
 displacements; models; Young's modulus; elastic constants  
 : mechanical properties; Mohr envelope; Wehr; examples  
 Black Forest; West Germany; Germany; Europe; stability  
 tensile strength; shear strength; uniaxial tests; finite  
 element analysis; statistical methods; extensometers  
 : Altmeinh Tunnel; case studies; Bremm  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978302 80-21634

**Numerical and physical modeling**  
 Smith, I. M.

**Numerical methods in geotechnical engineering**  
 Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
 Publ.: McGraw-Hill Book Co.  
 556-588p., 1977  
 ISBN: 0070165424 69 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 Illustrations: sections  
 Descriptors: \*engineering geology; techniques; models  
 : physical models; mathematical models; applications; failure  
 : slope stability; foundations; consolidation; rates  
 settlement; retaining walls; piles; stability; marine  
 installations; platforms; soil mechanics; deformation  
 : finite element analysis; statistical methods; elastoplastic  
 materials; clays  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978300 80-21335  
**Static analysis of earth retaining structures**  
 Clough, G. W.; Tsui, Y.  
 Stanford Univ., Dep. Civ. Eng., Stanford, Calif., USA; Duke Univ., USA

**Numerical methods in geotechnical engineering**  
 Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
 Publ.: McGraw-Hill Book Co.  
 508-527p., 1977  
 ISBN: 0070165424 64 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, sects.  
 Descriptors: \*foundations; \*soil mechanics; \*stability; deformation; retaining walls; numerical analysis; mathematical methods; finite difference analysis; finite element analysis; statistical methods; stress; elastic materials; linear materials; shear stress  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978298 80-21510  
**Foundations in expansive soils**  
 Lytton, R. L.  
 Tex. A&M Univ., Dep. Civ. Eng., College Station, Tex., USA

**Numerical methods in geotechnical engineering**  
 Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
 Publ.: McGraw-Hill Book Co.  
 427-457p., 1977  
 ISBN: 0070165424 41 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, sects.  
 Descriptors: \*foundations; \*soil mechanics; \*stability; materials; properties; expansive materials; design; materials; properties; clays; moisture; permeability; elasticity; stress; strain; bearing capacity; shear modulus; elastic constants; numerical analysis; finite difference analysis; finite element analysis; statistical methods; piles  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978297 80-21330  
**Two- and three-dimensional consolidation**  
 Christian, J. T.  
 Storm & Webster Eng. Corp., Boston, Mass., USA

**Numerical methods in geotechnical engineering**  
 Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
 Publ.: McGraw-Hill Book Co.  
 399-426p., 1977  
 ISBN: 0070165424 29 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., sects.

Descriptors: \*soil mechanics; \*settlement; numerical analysis; consolidation; two-dimensional models; models; three-dimensional models; mathematical methods; elasticity; stress; strain; isotropic materials; Lamé's constants; shear modulus; elastic constants; finite element analysis; statistical methods; pore pressure; examples  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978296 80-21614  
**One-dimensional consolidation**  
 Schiffman, R. L.; Arya, S. K.  
 Univ. Colo., Dep. Civ. Eng., Boulder, Colo., USA; Univ. Calif., San Diego, USA

**Numerical methods in geotechnical engineering**  
 Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
 Publ.: McGraw-Hill Book Co.  
 364-398p., 1977  
 ISBN: 0070165424 37 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*soil mechanics; \*settlement; layered materials; materials; properties; consolidation; one-dimensional models; models; loading; clays; numerical analysis; homogeneous media; pore pressure; finite difference analysis; mathematical methods; computer programs; PROGRS; finite element analysis; statistical methods; FECON 1; examples; Fortran; stress  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978295 80-21580

**Settlement of pile foundations**  
Poulos, H. G.

**Numerical methods in geotechnical engineering**  
Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
Publ: McGraw-Hill Book Co.  
326-363p., 1977  
ISBN: 0070165424 36 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables

Descriptors: \*foundations; \*soil mechanics ; piles;  
settlement ; loading; models; numerical analysis;  
deformation; displacements; layered materials; elastic  
materials; finite element analysis; statistical methods;  
examples  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978294 80-21589

**Laterally loaded piles**

Reese, L. C.; Desai, C. S.  
Univ. Tex. Austin, Dep. Civ. Eng., Austin, Tex., USA; Va.  
Polytech. Inst. and State Univ., USA

**Numerical methods in geotechnical engineering**  
Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
Publ: McGraw-Hill Book Co.  
297-325p., 1977  
ISBN: 0070165424 38 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus., table, sects.

Descriptors: \*foundations; \*soil mechanics ; piles;  
deformation ; shear; loading; iterative techniques;  
mathematical methods; response; soft clay; stiff clay;  
sand; clastic sediments; stress; strain; numerical  
analysis; finite difference analysis; finite element  
analysis; statistical methods; examples  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978291 80-21329

**Shallow foundations**

Christian, J. T.  
Stone & Webster Eng. Corp. Boston, Mass., USA  
**Numerical methods in geotechnical engineering**

Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
Publ: McGraw-Hill Book Co.  
211-234p., 1977  
ISBN: 0070165424 29 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: \*foundations; \*soil mechanics ; stability;  
deformation ; shallow foundations; models; finite element  
analysis; statistical methods; numerical analysis; stress;  
footings; displacements; elastic moduli; applications;  
shear modulus; elastic constants; SHANSEP  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978289 80-21402

**Finite element analysis for discontinuous rocks**

Goodman, R. E.; St. John, C.  
Univ. Calif., Dep. Civ. Eng., Berkeley, Calif., USA; Univ.  
Minn., USA

**Numerical methods in geotechnical engineering**  
Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)  
Publ: McGraw-Hill Book Co.  
148-175p., 1977  
ISBN: 0070165424 22 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, sects.

Descriptors: \*rock mechanics ; materials; properties ;  
discontinuities; materials, properties; finite element  
analysis; statistical methods; joints; fractures;  
mechanical properties; compression; shear; strength;  
iterative techniques; tensile strength; stiffness; shear  
strength  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978286 80-21684

**Viscoplasticity: a generalized model for description of soil behavior**

Zienkiewicz, O. C.; Humpheson, C.

**Numerical methods in geotechnical engineering**

Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)

Publ.: McGraw-Hill Book Co.

116-147p 1977

ISBN: 0070165424 30 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: BOOK Bibliographic Level: ANALYTIC

Languages: English

illus., tables, sects.

Descriptors: soil mechanics; materials; properties; viscoplasticity; materials, properties; models; porous materials; deformation; stress; loading; elastoviscoplastic materials; Mohr envelope; finite element analysis; statistical methods; consolidation; examples

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978286 80-21320

**Introduction, numerical methods, and special topics**

Chandrasekhar, S.; Christian, J. T.

Va. Polytech. Inst. and State Univ., Dep. Civ. Eng., Blacksburg, Va., USA; Stone & Webster Eng. Corp., USA

**Numerical methods in geotechnical engineering**

Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)

Publ.: McGraw-Hill Book Co.

1-64p., 1977

ISBN: 0070165424 107 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: BOOK Bibliographic Level: ANALYTIC

Languages: English

illus., sects.

Descriptors: engineering geology; techniques; numerical analysis; methods; finite element analysis; statistical methods; finite difference analysis; mathematical methods; examples; discontinuities; nonlinear analysis; propagation; Fourier analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

978285 80-21163

Stone & Webster Eng. Corp., USA

**Numerical methods in geotechnical engineering**

Desai, C. S. (EDITOR); Christian, J. T. (EDITOR)

Va. Polytech. Inst. and State Univ., Dep. Civ. Eng., Blacksburg, Va., USA

Publ.: McGraw-Hill Book Co.

783p., 1977

ISBN: 0070165424 650 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: BOOK Bibliographic Level: MONOGRAPHIC

Languages: English

Note: Individual papers are cited under the separate authors illus.

Descriptors: engineering geology; education; mathematical geology; textbooks; college-level education; numerical analysis; methods; mathematical methods; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

976181 80-16911

**Autoregressive parameters for a suite of strong-motion accelerograms**

Jurkevics, A.; Uirych, T. J.

Univ. B.C., Dep. Geophys. and Astron., Vancouver, B.C., CAN

Seismol. Soc. Am., Bull. 69: 6, 2025-2036p., 1979

CODEN: BSSAAP ISSN: 0037-1106 15 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus., table

Latitude: N323000; W1240000 Longitude: W1141500; W1243000

Descriptors: California; seismology; engineering geology; earthquakes; strong motion; United States; Southern California; autoregression; statistical methods; spectral analysis; accelerograms; ground motion; epicenters; geologic hazards

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

975136 80-16839

Finite element study of mine roadways

Fama, M. E.; Parton, I. M.

The New Zealand Geomechanics Society; papers presented to the Symposium on tunnelling in New Zealand

Olsen, A. J. (COMPILER); Riddolls, B. W. (COMPILER)

Tunnelling in New Zealand, Hamilton, New Zealand, 1977  
N. Z. Inst. Eng., Proc. Tech. Groups 3: 3(G), 3.39-3.52  
P., 1977

5 REFS.

Subfile: B  
Country of Publ.: New Zealand  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English

illus., tables  
Latitude: S473000; S343000 Longitude: E1783000; E1663000  
Descriptors: \*New Zealand ; engineering geology ; tunnels;  
Australia; coal measures; theoretical studies; finite  
element analysis; statistical methods; shaft pillars;  
stress; in situ; Young's modulus; elastic constants  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

975031 80-17073

Modeling of the Nobi ground water basin to solve the  
subsidence problem

Ueshita, K.; Itabashi, K.; Tanahashi, H.; Sato, T.

Proceedings of the Specialty session on geotechnical  
engineering and environmental control

Moh, Z. C. (EDITOR)

Ninth international conference on soil mechanics and  
foundation engineering, Tokyo, Japan, July 1977  
Int. Conf. Soil Mech. Found. Eng., Proc., 9, 465-480p.,  
1977

4 REFS.

Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English

illus., sect., sketch maps  
Latitude: N340000; N380000 Longitude: E1380000; E1340000  
Descriptors: \*Japan; ground water ; hydrogeology; surveys  
; engineering geology ; land subsidence; Asia; Nobi plain;  
wells; pumping; models; water balance; finite element  
analysis; statistical methods; three-dimensional models;  
1961-1973; piezometers; levels; aquifers; Young's modulus;  
elastic constants; storage; mathematical models; Honshu  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

975025 80-17069

Mineralogical and geotechnical controls on the storage and  
use of British coal-mine wastes

Taylor, R. K.; Cobb, A. E.

Proceedings of the Specialty session on geotechnical  
engineering and environmental control

Moh, Z. C. (EDITOR)

Ninth international conference on soil mechanics and  
foundation engineering, Tokyo, Japan, July 1977  
Int. Conf. Soil Mech. Found. Eng., Proc., 9, 373-388p.,  
1977

12 REFS.

Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English

illus., tables  
Latitude: N500000; N554500 Longitude: E0013000; W0063000  
Descriptors: \*England ; engineering geology ; waste  
disposal; Europe; coal; organic residues; spoils;  
settling ponds; mineral composition; engineering properties;  
consolidation; shear strength; statistical analysis;  
chemical composition; mechanical properties; clay minerals;  
sheet silicates; silicates  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

974416 80-16917

**Guiding principles for the preparation of hydrological maps for building**  
Karacsonyi, S.; Bernath, Z.

**IAEG symposium: Engineering geological mapping for planning, design and construction in civil engineering**

Dearman, W. R. (Chairperson)  
IAEG symposium: Engineering geological mapping for planning, design and construction in civil engineering.  
Newcastle-upon-Tyne, United Kingdom, Sept. 3-6, 1979  
Int. Assoc. Eng. Geol., Bull., 19, 237-241p., 1979

CODEN: BIEGR6

Subfile: B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English Summary Languages: French

Illus., sects., geol. sketch map  
Descriptors: maps; engineering geology; cartography; site exploration; land use maps; hydrogeologic maps; ground water; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

973106 80-16808

**Probabilistic evaluation of the design basis seismic ground motion (DBSM) for Chats Falls site**

Dennis, J. J.

Ont. Hydro, Toronto, Ont., CAN

Candian Geophysical Union,

Fredericton, N.B., Canada, June 4-6, 1979  
Eos (Am. Geophys. Union, Trans.) 60: 42, 754-755p., 1979

CODEN: EOSTAJ ISSN: 0096-3941

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Latitude: N420000 Longitude: W0700000; W0900000  
Descriptors: Canada; seismology; engineering geology; seismicity; geologic hazards; seismic risk; Chat Falls; probability; design; ground motion; site exploration  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

972270 80-17071

**Metal versus nonwoven fiber fabric earth reinforcement in dry sands; a comparative statistical analysis of model tests**

Turnay, M. T.; Antonini, M.; Aream, A.

Ln. State Univ., Dep. Civil Eng., Baton Rouge, La., USA

Geotech. Text. J. 2: 1, 44-60p., 1979

CODEN: GTJDDJ ISSN: 0149-6115 10 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

Illus., block diag., sect., tables, plates

Descriptors: soil mechanics; materials; properties; sand; materials, properties; clastic sediments; models; reinforcement; statistical analysis; stress; density; physical properties; friction; engineering geology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

972365 80-16790

**Deformation and strength characteristics of soft Bangkok Clay discussion**

Cheney, J. A.

Univ. Calif. Davis, Dep. Civil Eng., Davis, Calif., USA

Am. Soc. Civ. Eng. Proc., J. Geotech. Eng. Div. 105: G79, 1129-1131p., 1979

CODEN: AUGEB6 ISSN: 0093-6405 2 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

Note: For reference to original article by Balasubramanian, A. S. and Chaudhry, A. R., see Vol. 104, No. G19, 1978, illus.

Descriptors: soil mechanics; deformation; consolidation; engineering geology; stress; strain; shear strength; soft clays; clays; Bangkok Clay; loading; materials; properties; physical properties; mechanical properties; statistical analysis; Cam Clay theory  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 972264 80-16847  
**Prediction of undrained behavior of sand** discussion  
 Flaviigny, E.; Foray, P.; Darve, F.  
 Am. Soc. Civ. Eng., Proc., J. Geotech. Eng. Div. 105: G19, 1126-1129p., 1979  
 CODEN: AJGEB6 ISSN: 0093-6405 5 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: For reference to original article by Lade, P. V., see Vol. 104, No. G16, 1978. illus.  
 Descriptors: \*soil mechanics; materials; properties; sand; Chattanooga Sand; engineering geology; clastic sediments; materials, properties; pore pressure; stress; strain; confining pressure; permeability; density; inhomogeneity; sample preparation; saturation; shear strength; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 972258 80-16756  
**Probabilistic evaluation of safety of soil structures**  
 Athanasian-Grivas, D.  
 Rensselaer Polytech. Inst., Troy, N.Y., USA  
 Am. Soc. Civ. Eng., Proc., J. Geotech. Eng. Div. 105: G19, 1091-1095p., 1979  
 CODEN: AJGEB6 ISSN: 0093-6405 1 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table  
 Descriptors: \*soil mechanics; deformation; loading; engineering geology; physical properties; stability; failure; stress; strain; density; statistical analysis; geologic hazards; foundations  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 971655 80-12306  
**Il calcolo dello stato di sollecitazione indotto dallo scavo di una galleria di forma arbitraria entro un ammasso roccioso anisotropo in un campo di sollecitazioni triassiali**  
 Calculation of the state of stress induced by the excavation of a tunnel of arbitrary shape within an anisotropic rock mass in a triaxial stress field  
 Ribacchi, R.  
 Ind. Min. (Rome) 27: 2, 57-68p., 1976  
 CODEN: IMIRAK ISSN: 0019-7696  
 Subfile: B  
 Country of Publ.: Italy  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC
- 970481 80-11930  
**Consequence of an earthquake prediction on statistical estimate of the seismic risk**  
 Anderson, J. G.  
 Univ. South. Calif., Dep. Civ. Eng., Los Angeles, Calif., variously paginatedp., 1979  
 Subfile: B  
 Doc Type: REPORT Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: U. S. Geol. Surv., United States  
 illus., tables  
 Descriptors: \*earthquakes; \*automatic data processing; \*seismology; prediction; engineering geology; seismic risk; geologic hazards; ground motion; computer programs; FORISK; strong motion; seismicity; statistical analysis; magnitude; intensity  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 969444 80-12216  
**Ogólna metoda sprawdzania stateczności zboczy wzdłuż dowolnych powierzchni poslizgu Czesc III**  
 General analysis of slope stability along arbitrary slip surfaces; Part III, Estimation equilibrium method  
 Madej, J.  
 Arch. Hydrotech. 25: 4, 491-507p., 1978  
 CODEN: AHDRAF ISSN: 0004-0789 23 REFS.  
 Subfile: B  
 Country of Publ.: Poland  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Polish Summary Languages: Russian  
 illus., tables  
 Descriptors: \*slope stability; \*soil mechanics; theoretical studies; plane failure; cohesionless materials; limit equilibrium method; strain; stress; finite element analysis; statistical methods; elastoplastic materials; experimental studies  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- Languages: Italian Summary Languages: English  
 Descriptors: \*rock mechanics; \*tunnels; (theoretical) studies; stress; mathematical models; models; underground space; finite element analysis; statistical methods; complex variable method; excavations  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 969091 80-11715  
**Seismic classification of rock mass qualities**  
 Sjogren, B.; Dythius, A.; Sandberg, J.  
 Geophys. Prospect. (The Hague) 27: 2. 409-442p., 1979  
 CODEN: GPPRAR ISSN: 0016-8025 9 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: geophysical methods; seismic methods; applications; P-waves; statistical analysis; fractures; structure; weathering; elastic constants; S-waves; rock mechanics; Poisson's ratio; velocity  
 Section Headings: 20 (GEOPHYSICS, APPLIED)
- 967562 80-08256  
**Regional assessment of seismic risk in eastern Canada**  
 Basham, P. W.; Weichert, D. H.; Berry, M. J.  
 Earth Phys. Branch, Ottawa, Ont., CAN  
 Seismol. Soc. Am., Bull. 69: 5. 1567-1602p., 1979  
 CODEN: BSSAAP ISSN: 0037-1106 54 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: Can., Earth Phys. Branch; Contrib. No. 786, illus., tables, sketch maps  
 Latitude: N400000; Longitude: W0500000; W0900000  
 Descriptors: Canada; Quebec; seismicity; engineering geology; earthquakes; geologic hazards; seismic risk; Northern Appalachians; Appalachians; Maritime Provinces; Saint Lawrence Valley; probability; prediction; seismicity; zonation; regional patterns; history; numerical analysis; statistical methods; nuclear facilities  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 967561 80-08566  
**On Canadian methodologies of probabilistic seismic risk estimation**  
 Weichert, D. H.; Milne, W. G.  
 Pac. Geosci. Cent., Sidney, B.C., CAN  
 Seismol. Soc. Am., Bull. 69: 5. 1549-1566p., 1979  
 CODEN: BSSAAP ISSN: 0037-1106 21 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: Can., Earth Phys. Branch; Contrib. No. 792, illus., tables, sketch map  
 Latitude: N470000; Longitude: W0520000; W1410000
- Descriptors: Canada; Quebec; seismicity; engineering geology; earthquakes; geologic hazards; seismic risk; prediction; probability; mathematical methods; numerical analysis; Appalachians; Maritime Provinces; Saint Lawrence Valley  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 967005 80-08046  
**Mechanics of particulate media; a probabilistic approach**  
 Harr, M. E.  
 Purdue Univ., Dep. Civ. Eng., West Lafayette, Indiana, USA  
 Publ: McGraw Hill  
 543p., 1977  
 752 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Note: Advanced book program, illus.  
 Descriptors: engineering geology; soil mechanics; textbooks; theoretical studies; foundations; mathematical geology; statistical analysis; probability; seepage; ground water; particulate materials; settlement; granular materials  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 966744 80-08435  
**Determination d'une loi de comportement pour le cisaillement des sols pulvérulents; application au calcul d'essais triaxiaux**  
 Determination of a law for the shearing behavior of non-cohesive soils; application to the calculation of triaxial tests  
 Monnet, J.; Gielly, J.  
 Rev. Fr. Geotech. 7. 45-56p., 1979  
 29 REFS.  
 Subfile: B  
 Country of Publ.: France  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: French Summary Languages: English  
 tables, charts  
 Descriptors: soil mechanics; theoretical studies; triaxial tests; finite element analysis; statistical methods; shear; soils; strain; stress; plastic flow; mathematical models; models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

966741 80-08271

Method de calcul du comportement des pieux a l'arrachement  
 Method for calculating the behavior of piles in extraction  
 Boulon, M.; Desrués, J.; Foray, P. 1979  
 Rev. Fr. Geotech. 7, 11-22p., 17 REFS.

Subfile: B  
 Country of Publ.: France  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: French  
 Note: Lecture at the meeting of the French Committee on Soil  
 Mechanics on June 19, 1978. illus., charts  
 Descriptors: \*soil mechanics; \*foundations; theoretical  
 studies; experimental studies; piles; clay; clastic  
 sediments; sand; shear; finite element analysis;  
 statistical methods; loading  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

966739 80-08299

Analisi numerico-statistica di prove penetrometriche su  
 vasta scala  
 Numerical-statistical analysis of large-scale penetrometric  
 tests

Crespellani, T.; Lol, A  
 Riv. Ital. Geotec. 12, 2, 78-100p., 1978  
 CODEN: RITGAI 17 REFS.

Subfile: B  
 Country of Publ.: Italy  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Italian Summary Languages: English  
 Descriptors: \*soil mechanics; methods; statistical  
 analysis; mathematical models; models; ecology; cluster  
 analysis; statistical methods; sedimentary rocks; sediments  
 ; land use; penetrometer tests  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

966705 80-08410

Kritische Betrachtung der Anwendungsmöglichkeit ten von  
 Finite-Element-Berechnungen im Felsbohrerausbau  
 Critical consideration on the possibilities of applying the  
 finite element calculations in rock excavation engineering  
 Lielups, L.; Obenaus, P. V.

Berechnung, Erkundung und Entwurf von Tunneln und  
 Felsbauwerken--Computation, exploration and design of tunnels  
 and rock structures  
 Mueller, L.(EDITOR)  
 Rock Mech., Suppl. 8, 43-56p., 1979  
 ISSN: 0080-3375 14 REFS.

Subfile: B  
 Country of Publ.: International

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: English  
 illus.

Descriptors: \*tunnels; \*rock mechanics; excavations;  
 materials; properties; stress; finite element analysis;  
 statistical methods; materials, properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

966569 80-08577

The applications of non-linear finite elements method in  
 engineering geology  
 Yin Youquan; Gu Shengnian; Liu Jun  
 Sci. Geol. Sinica 3, 236-251p., 1979  
 CODEN: SGSIAG 10 REFS.

Subfile: B  
 Country of Publ.: China  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Chinese Summary Languages: English  
 illus., tables, sect.  
 Descriptors: \*engineering geology; methods; mathematical  
 methods; finite element analysis; statistical methods;  
 non-linear analysis; stress; elastoplastic materials;  
 strain  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

966345 80-08486

Sampling of peat  
 Sasaki, H.  
 Tsuchi-to-Kiso 27, 5, 31-38p., 1979  
 7 REFS.

Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus., table  
 Descriptors: \*soil mechanics; deformation; sampling;  
 peat; organic sediments; properties; statistical methods;  
 structure; morphology; techniques; shear strength;  
 materials, properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

966227 80-07646

Physikalische Prozesse in Erdbengabelten; Interpretationsmöglichkeiten mit Laborexperimenten an Gesteinen  
 Physical processes in earthquake regions; possibilities of interpretation by means of laboratory experiments on rocks

Stiller, H.; Wagner, F. C.  
 Z. Angew. Geol., 24: 11, 456-464p., 1978  
 CODEN: ZANGAK ISSN: 0044-2259 27 REFS.  
 Subfile: B

Country of Publ.: German Democratic Republic  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: Russian  
 Descriptors: \*earthquakes; \*deformation; \*seismology  
 focus; experimental studies; rock mechanics; pore pressure  
 ; elastic waves; velocity; faults; fractures; genesis;  
 statistical analysis; stochastic processes; basalt; basalt  
 family; breccia; clastic rocks; lunar materials; dunite;  
 ultramafic family; gneiss; gneisses; granite;  
 granite-granodiorite family; sandstone; siallow-focus  
 earthquakes; sedimentary rocks; igneous rocks; metamorphic  
 rocks; Poisson's ratio; elastic constants; porosity;  
 conductivity; electrical conductivity; thermal conductivity;  
 mathematical models; model  
 Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

966043 80-08525

A statistical study on the relations between landslides and topography, geology and rainfall factors in the Kurobe River Basin

Takase, N.; Kimura, M.; Hata, T.; Tamura, T.  
 Kanazawa Univ., Jap. Sea Res. Inst., Bull., 10, 103-115p., 1978  
 CODEN: KJUR88 12 REFS.  
 Subfile: B

Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus., tables, sketch map  
 Latitude: N364000; N370000 Longitude: E1374500; E1371500  
 Descriptors: \*Japan; \*geomorphology; \*environmental geology  
 ; engineering geology; mass movements; geologic hazards;  
 slope stability; landslides; Asia; Kurobe River basin;  
 Honshu; topography; atmospheric precipitation; rain;  
 mechanism; statistical analysis; urban planning  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965956 80 08552

Matematiko-statistiko hodneceni metodiky mereni reologických a koldních vlastností suspenze bentonitu evliivna syntanovnyh zlekuovadly  
 A mathematical and statistical evaluation of the methods for

measuring the rheological and colloidal properties of a syntan-affected bentonite suspension

Válisová, I.; Frišl, Z.; Esterka, F.  
 Pr. Vysk. Ústavu Geol. Inz., 34: Publikace 252-268, 149-160p., 1976  
 CODEN: PVUIDX ISSN: 0139-763X 14 REFS.  
 Subfile: B

Country of Publ.: Czechoslovakia  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Czech Summary Languages: Russian  
 illus., tables  
 Descriptors: \*engineering geology; petroleum engineering  
 ; methods; drilling; polyphenolic syntanes; stabilizers;  
 mathematical models; models; petroleum  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965843 80-08463

Some simple expressions for the probability of failure of a finite reservoir with Markovian input

Pegram, G. G. S.  
 Geophys. Res. Lett., 5: 1, 13-15p., 1978  
 CODEN: GRLAU ISSN: 0094-8276 6 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*reservoirs; design; theoretical studies; engineering geology; Markov chain analysis; mathematical methods; failure; probability; stochastic processes  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965825 80-08111

The selection of soil parameters for the design of foundations

Peck, R. B.  
 Seventh national meeting of the Mexican Society for Soil Mechanics, Guadalajara, Mexico, Nov. 23, 1974  
 Nabor Carrillo Lect. [Ser.] 2, 9-47p., 1975  
 Subfile: B

Country of Publ.: Mexico  
 Doc Type: SERIAL CONFERENCE PUBLICATION Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Descriptors: \*foundations; design; soil mechanics; site exploration; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965821 80-08535  
 Untersuchungen der Einflussfaktoren auf die Höhe des Abgabekoeffizienten von Erdgaslagerstätten  
 The factors affecting the recovery coefficient of natural gas deposits  
 Teumer, P.; Anclan, P.; Voigt, D.; Heuer, K.

Country of Publ.: Czechoslovakia  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: Russian  
 Descriptors: \*engineering geology; petroleum engineering; natural gas; recovery; mathematical models; models; pressure; deposits; pressure gradient; methods; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965587 80-08251  
 Anisotropic elastoplastic undrained analysis of soft clays  
 Ballster, F.; Sagasta, C.  
 Geotechnique 29: 3, 323-340p., 1979  
 CODEN: GTNOJ8 ISSN: 0016-8505 32 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Descriptors: \*soil mechanics; experimental studies; loading; clays; mathematical models; models; failure; shear strength; consolidation; pressure; finite element analysis; statistical methods; settlement; Young modulus; yields  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965821 80-08535  
 Untersuchungen der Einflussfaktoren auf die Höhe des Abgabekoeffizienten von Erdgaslagerstätten  
 The factors affecting the recovery coefficient of natural gas deposits  
 Teumer, P.; Anclan, P.; Voigt, D.; Heuer, K.  
 Spornik VIII Mezinarodni vedecke konference o geochemickych a fyzikalne chemickych problemech pri pruzkumu a tezbe lozisek zivc, Sekce C, Angewandte Chemie der Erdbe- und Erdgasfoerderung  
 Svestka, J. (EDITOR)  
 Spornik VIII Mezinarodni vedecke konference o geochemickych a fyzikalne chemickych problemech pri pruzkumu a tezbe lozisek zivc, Gottwaldove, Czechoslovakia, April 24-28, 1976  
 Pr. Vysl. Ustavu Geol. Inz. 35: 3, 176-192p., 1978  
 CODEN: PVIDX ISSN: 0199-763X 6 REFS.  
 Subfile: B  
 Country of Publ.: Czechoslovakia  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: Russian  
 Descriptors: \*engineering geology; petroleum engineering; natural gas; recovery; mathematical models; models; pressure; deposits; pressure gradient; methods; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

964592 80-08283  
 Non-linear response of structure-fluid-foundation system to earthquake excitation  
 Chang, C. T.; Hinton, E.; Zienkiewicz, D. C.

Country of Publ.: United Kingdom  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*foundations; stability; seismic response; finite element analysis; statistical methods; earthquakes; liquefaction; stress; equations; engineering geology; mathematical methods; offshore  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965587 80-08251  
 Anisotropic elastoplastic undrained analysis of soft clays  
 Ballster, F.; Sagasta, C.  
 Geotechnique 29: 3, 323-340p., 1979  
 CODEN: GTNOJ8 ISSN: 0016-8505 32 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Descriptors: \*soil mechanics; experimental studies; loading; clays; mathematical models; models; failure; shear strength; consolidation; pressure; finite element analysis; statistical methods; settlement; Young modulus; yields  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

964592 80-08283  
 Non-linear response of structure-fluid-foundation system to earthquake excitation  
 Chang, C. T.; Hinton, E.; Zienkiewicz, D. C.  
 Numerical methods in offshore engineering  
 Zienkiewicz, D. C. (EDITOR); Lewis, R. W. (EDITOR); Stagg, K. G. (EDITOR)  
 Numerical methods in offshore engineering. Swansea, Wales, United Kingdom, Jan., 1977  
 Publ.: John Wiley & Sons  
 341-358p., 1978  
 32 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*foundations; stability; seismic response; finite element analysis; statistical methods; earthquakes; liquefaction; stress; equations; engineering geology; mathematical methods; offshore  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965821 80-08535  
 Untersuchungen der Einflussfaktoren auf die Höhe des Abgabekoeffizienten von Erdgaslagerstätten  
 The factors affecting the recovery coefficient of natural gas deposits  
 Teumer, P.; Anclan, P.; Voigt, D.; Heuer, K.

Country of Publ.: German Democratic Republic  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: German  
 Descriptors: \*soil mechanics; deformation; finite element analysis; engineering geology; instruments; stress; strain; mathematical models; models; statistical methods; sediments; Clays; methods; materials, properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965587 80-08251  
 Anisotropic elastoplastic undrained analysis of soft clays  
 Ballster, F.; Sagasta, C.  
 Geotechnique 29: 3, 323-340p., 1979  
 CODEN: GTNOJ8 ISSN: 0016-8505 32 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Descriptors: \*soil mechanics; experimental studies; loading; clays; mathematical models; models; failure; shear strength; consolidation; pressure; finite element analysis; statistical methods; settlement; Young modulus; yields  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

965468 80-08491  
 Ermittlung des Spannungs-Verformungsverhaltens von Lockergesteinen als Voraussetzung der Anwendung der Methode der finiten Elemente  
 Determination of stress-strain behavior in unconsolidated

Country of Publ.: German Democratic Republic  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: German  
 Descriptors: \*soil mechanics; deformation; finite element analysis; engineering geology; instruments; stress; strain; mathematical models; models; statistical methods; sediments; Clays; methods; materials, properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Country of Publ.: German Democratic Republic  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: German  
 Descriptors: \*soil mechanics; deformation; finite element analysis; engineering geology; instruments; stress; strain; mathematical models; models; statistical methods; sediments; Clays; methods; materials, properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

963077 80-04535

**Prediction of earth pressure in retaining structure**

Matsuaki, K.  
Univ. of New South Wales, AUS  
unknown.  
1979  
Subfile: B

Degree Level: Doctoral

Country of Publ.: Australia  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Languages: English

Availability: Univ. Microfilms

Descriptors: \*soil mechanics ; earth pressure ; prediction ; theoretical studies ; experimental studies ; structures ; deformation ; stress ; strain ; triaxial tests ; finite element analysis ; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

963009 80-04307

**A statistical study of changes in channel geometry of the lower Missouri River**

Belt, C. B., Jr.

Box 8099, Pierre LaCade Stn., St. Louis, Mo., USA

The Geological Society of America, 92nd annual meeting, San Diego, Calif., United States, Nov. 5-8, 1979

Geol. Soc. Am. Abstr. Programs 11: 7, 387p., 1979

CODEN: GAAPBC ISSN: 0016-7592

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*Missouri ; hydrology ; geomorphology ; engineering geology ; surveys ; fluvial features ; waterways ; Missouri River ; channel geometry ; Saint Charles County ; Gasconade County ; United States ; Lower Missouri River ; Herrmann ; Saint Charles ; rivers and streams ; discharge ; floods ; statistical analysis ; hydraulics ; changes ; channels ; velocity ; mathematical models ; levees

Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

962779 80-04704

**FEM-analys jämförd med modellstudier**

Finite element analysis compared to model studies

Groth, T.; Jönasson, P.

Foerdrag och diskussioner vid Bergmekaniskt diskussionsmo-

te

Franzen, T. (EDITOR)

Rock mechanics meeting, Stockholm, Sweden, Feb. 21, 1978

Publ: Stiftelsen Bergteknisk Forskning:Befo

119-136p., 1978

Subfile: B

Country of Publ.: Sweden

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: Swedish Summary Languages: English

illus.

Descriptors: \*rock mechanics ; experimental studies ; finite element analysis ; statistical methods ; photogrammetry ; biaxial tests ; caverns ; structural analysis ; models ; underground space

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

962765 80-04692

**Vergleichende Untersuchungen an Hohlrumbauteen mittels numerischer Berechnung**

Comparative studies of hollow space constructions based on numerical calculations

Froehlich, B.

Grundlagen und Anwendung der Felsmechanik

Natau, O. (EDITOR); Fecker, E. (EDITOR); Reik, G. (EDITOR)

Grundlagen und Anwendung der Felsmechanik; Felsmechanik

Kolloquium, Karlsruhe, Germany, Federal Republic of, Feb. 23-24, 1978

Publ: Trans Tech Publ.

233-245p., 1978

ISBN: 0878490299 6 REFS.

Subfile: B

Country of Publ.: Germany, Federal Republic of

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: German

illus.; table, charts

Descriptors: \*tunnels ; construction ; stability ; engineering geology ; underground space ; finite element analysis ; statistical methods ; joints ; fractures ; rock ; West Germany ; Germany ; Europe ; automatic data processing ; galleries

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

962759 80 04608

**Kriechen, relaxation und dynamische Spannungsumlagerungen im Fels**  
**Creep, relaxation and dynamic changes of stress in rocks**  
 Born, G

**Grundlagen und Anwendung der Felsmechanik**  
 Natsu, D (EDITOR); Ficker, E (EDITOR); Reik, G (EDITOR)  
 Grundlagen und Anwendung der Felsmechanik; Felsmechanik  
 Kolloquium, Karlsruhe, Germany, Federal Republic of, Feb.  
 23-24, 1978  
 Publ Trans Tech Publ  
 155-166p., 1978  
 ISBN 0878490299 23 REFS.

Country of Publ.: Germany, Federal Republic of  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: German  
 illus.

Descriptors: rock mechanics; automatic data processing;  
 applications; engineering geology; dynamics; rheology;  
 creep; relaxation; stress; tunnels; models; structural  
 analysis; faults; foundations; finite element analysis;  
 statistical methods; joints; fractures  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

962652 80-04859

**Statistical theory of sampling nonuniform soils**  
 Ratz, M. V.; Sheinin, V. I.

**International symposium, The geotechnics of structurally  
 complex formations; Volume I**

Anonymous  
 International symposium; The geotechnics of structurally  
 complex formations, Capri, Italy, 1977  
 Publ: Assoc. Geotec. Ital.  
 395-399p., 1977  
 10 REFS.

Country of Publ.: Italy  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.

Descriptors: soil mechanics; foundations; statistical  
 methods; engineering geology; sampling; Monte Carlo  
 analysis; inhomogeneity; theoretical studies  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Numerical analysis of reinforced soil systems**

Herrmann, L. R.; Al-Yassin, Z.  
 Univ. Calif., Dep. Civ. Eng., Davis, Calif., USA

**Symposium on earth reinforcement**  
 Mitchell, J. K. (chairperson)  
 Symposium on earth reinforcement, Pittsburgh, Pa., United  
 States, April 27, 1978  
 Publ: Am. Soc. Civ. Eng.  
 428-457p., 1979  
 14 REFS.

Country of Publ.: United States  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.; sects.

Descriptors: soil mechanics; materials; properties;  
 reinforced earth; materials; properties; numerical analysis;  
 plane strain; inelastic materials; finite element analysis;  
 statistical methods; stress; models; displacements;  
 reinforcement  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Numerical analysis of a reinforced earth wall**

Al-Hussaini, M.; Johnson, L. D.  
 U. S. Army Eng. Water. Exp. Stn., Soils and Pavement Lab.,  
 Vicksburg, Miss., USA

**Symposium on earth reinforcement**  
 Mitchell, J. K. (chairperson)  
 Symposium on earth reinforcement, Pittsburgh, Pa., United  
 States, April 27, 1978  
 Publ: Am. Soc. Civ. Eng.  
 98-126p., 1979  
 10 REFS.

Country of Publ.: United States  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.; table, sects.

Descriptors: slope stability; foundations; soil mechanics;  
 reinforced earth; earthworks; materials; properties;  
 properties; retaining walls; strain; stress; shear;  
 finite element analysis; statistical methods; numerical  
 analysis; field studies; reinforcement  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

962099 80-04721

961897 80-04647

**Statistical variation in stress-volumetric strain behavior of Westerly Granite**

Constantino, M. S.  
Int. J. Rock Mech. Min. Sci. Geomech. Abstr. 15: 3, 105-111p., 1978  
ISSN: 0148-9062 7 REFS.  
Subfile: B

Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
illus., tables

Descriptors: rock mechanics; experimental studies; compression; materials, properties; stress; strain; Westerly Granite; statistical analysis; mathematical methods; triaxial tests  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

960902 80-04837

**Pore-pressure dissipation during excavation**

Osnami, A. E.; Clough, G. W.  
Stanford Univ., Dep. Civ. Eng., Stanford, Calif., USA  
Am Soc. Civ. Eng., Proc., J. Geotech. Eng. Div. 105: G14, 481-496p., 1979  
CODEN: AJGEB6 ISSN: 0093-6405 16 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
illus.

Descriptors: soil mechanics; materials; properties; clays; pore pressure; engineering geology; excavations; finite element analysis; statistical methods; stress; consolidation; mathematical models; models; theoretical studies; materials, properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

960186 80 01309

**Elastic-plastic finite element models of forced folds and comparison with specific natural structures**

Jamison, W. R.; Stearns, D. W.  
Tex. A&M Univ., Cent. Tectonophys., College Station, Tex., USA  
American Geophysical Union; 1979 spring annual meeting, Washington, D.C., United States, May 28-June 1, 1979  
Eos (Am Geophys. Union, Trans.) 60: 18, 371p., 1979  
CODEN: EOSIAU ISSN: 0096-3941  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Latitude: N370000 Longitude: W1090000  
Descriptors: Colorado; deformation; rock mechanics; folds; structural geology; theoretical studies; mechanics; elasticity; models; Wingate Sandstone; finite element analysis; statistical methods; mathematical models; strain; plasticity; strain hardening; sandstone; clastic rocks; Triassic; Mesozoic; United States; Uncompagine Plateau; structural analysis; geometry; energy  
Section Headings: 16 (STRUCTURAL GEOLOGY)

959155 80-02055

**A Bayesian model for seismic hazard mapping**

Mortgat, C. P.; Shah, H. C.  
TERA Corp., Berkeley, Calif., USA; Stanford Univ., USA  
Seismol. Soc. Am., Bull. 69: 4, 1237-1251p., 1979  
CODEN: BSSAAP ISSN: 0037-1106 13 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
illus., sketch map

Descriptors: seismic hazards; maps; automatic data processing; Costa Rica; earthquakes; cartography; engineering geology; models; mathematical models; Bayesian theory; seismicity; statistical methods; geometry; algorithms; seismic risk  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

959081 80-01945  
**Theoretical study of hydraulically fractured penny-shaped cracks in hot, dry rocks**  
 Abe, H.; Keer, L. M.; Mura, T.  
 Northwest Univ., Dep. Civ. Eng., Evanston, Ill., USA  
 Int. J. Numer. Anal. Methods Geomech. 3: 1, 79-96p., 1979  
 ISSN: 0363-9061 10 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: tables  
 Descriptors: geothermal energy; fractures; rock mechanics; production; genesis; materials; properties; hot dry rocks; hydraulic fracturing; elastic materials; materials; properties; homogeneous materials; isotropic materials; viscous materials; permeability; stress; two-dimensional models; models; granite; granite-granodiorite family; Poisson's ratio; elastic constants; displacements; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

958168 80-01981  
**Antecedentes geotécnicos para el hundimiento forzado con tiros de gran diametro en mina El Teniente**  
**Geotechnical antecedents for forced caving by means of large holes in El Teniente Mine**  
 Charon, J.; Krstulovic, G.  
 Minerías 33: 144, 23-41p., 1978  
 CODEN: MINCAN 11 REFS.  
 Subfile: B  
 Country of Publ.: Chile  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Spanish Summary Languages: English  
 illus.: tables  
 Latitude 556000; 5174500 Longitude W0870000; W0760000  
 Descriptors: Chile; mining geology; engineering geology; methods; forced caving; South America; El Teniente; applications; excavations; stability; models; design; pillars; finite element analysis; statistical methods; theoretical studies; mathematical models; production control  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957998 80-02000  
**Swiss use of the computer in soil mechanics**  
 Dvsi, M.  
 Proceedings of the specialty session on computers in soil mechanics; present and future  
 Schiffman, R. I. (EDITOR)

Ninth international conference on soil mechanics and foundation engineering, Tokyo, Japan, July, 1977  
 Int. Conf. Soil Mech. Found. Eng., Proc., 9, 268-288p., 1978  
 CODEN: PCSMB2 19 REFS.  
 Subfile: B  
 Country of Publ.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: tables  
 Latitude: N454500; N474500 Longitude: E0103000; E0055000  
 Descriptors: Switzerland; soil mechanics; automatic data processing; engineering geology; methods; Europe; slope stability; finite element analysis; statistical methods; models; foundations; settlement; loading; piles  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957994 80-02109  
**Finite element computations using an elastoplastic soil model for geotechnical problems of soft clay**  
 Wroth, C. P.; Zytynski, M.  
 Proceedings of the specialty session on computers in soil mechanics; present and future  
 Schiffman, R. I. (EDITOR)

Ninth international conference on soil mechanics and foundation engineering, Tokyo, Japan, July, 1977  
 Int. Conf. Soil Mech. Found. Eng., Proc., 9, 193-243p., 1978  
 CODEN: PCSMB2 28 REFS.  
 Subfile: B  
 Country of Publ.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: tables  
 Descriptors: soil mechanics; automatic data processing; theoretical studies; engineering geology; clays; finite element analysis; statistical methods; models; elastoplasticity; mathematical models; elasticity; triaxial tests; simulation; applications; computers  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957998 80-02000  
**Swiss use of the computer in soil mechanics**  
 Dvsi, M.  
 Proceedings of the specialty session on computers in soil mechanics; present and future  
 Schiffman, R. I. (EDITOR)

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957993 80-02083  
**The role of finite element techniques in applied soil mechanics and foundation engineering**  
 Shaw, D. E.; Rizzo, P. C.; D'Appolonia, F.  
 D'Appolonia Consulting Eng., Pittsburgh, Pa., USA  
**Proceedings of the specialty session on computers in soil mechanics; present and future**  
 Schiffman, R. L. (EDITOR).  
 Ninth international conference on soil mechanics and foundation engineering. Tokyo, Japan, July, 1977  
 Int. Conf. Soil Mech. Found. Eng., Proc. 9, 143-192p., 1978  
 CODEN: PCSMB2 25 REFS.  
 Subfile: B  
 Country of Pub.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Illustrations: tables  
 Descriptors: \*soil mechanics; \*foundations; \*dams; \*nuclear facilities; methods; mathematical methods; theoretical studies; finite element analysis; statistical methods; applications; deformation; Europe; seismic response; mathematical models; models; Canada; stress; automatic data processing  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957991 80-02042  
**Finite element computer programs for seismic soil-structure interaction-analysis**  
 Lymer, J.; Seed, H. B.  
 Univ. Calif., Dep. Civ. Eng., Berkeley, Calif., USA  
**Proceedings of the specialty session on computers in soil mechanics; present and future**  
 Schiffman, R. L. (EDITOR)  
 Ninth international conference on soil mechanics and foundation engineering. Tokyo, Japan, July, 1977  
 Int. Conf. Soil Mech. Found. Eng., Proc. 9, 123-124p., 1978  
 CODEN: PCSMB2  
 Subfile: B  
 Country of Pub.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Descriptors: \*soil mechanics; \*automatic data processing; methods; engineering geology; finite element analysis; statistical methods; computers; mathematical methods; foundations; possibilities  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957992 80-02048  
**Predicted and measured pore pressures in a dam**  
 Marr, W. A.; Lamb, T. W.  
 Mass. Inst. Technol., Dep. Civ. Eng., Cambridge, Mass., USA  
**Proceedings of the specialty session on computers in soil mechanics; present and future**  
 Schiffman, R. L. (EDITOR)  
 Ninth international conference on soil mechanics and foundation engineering. Tokyo, Japan, July, 1977  
 Int. Conf. Soil Mech. Found. Eng., Proc. 9, 124-142p., 1978  
 CODEN: PCSMB2 5 REFS.  
 Subfile: B  
 Country of Pub.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Illustrations: tables, sects.  
 Descriptors: \*Florida; engineering geology; dams; pore pressure; gypsum; sulfates; finite element analysis; statistical methods; Tampa; United States; theoretical studies; mathematical methods; seepage; stability; foundations; properties; prediction; Darcy's law; automatic data processing

957993 80-02083  
**The role of finite element techniques in applied soil mechanics and foundation engineering**  
 Shaw, D. E.; Rizzo, P. C.; D'Appolonia, F.  
 D'Appolonia Consulting Eng., Pittsburgh, Pa., USA  
**Proceedings of the specialty session on computers in soil mechanics; present and future**  
 Schiffman, R. L. (EDITOR).  
 Ninth international conference on soil mechanics and foundation engineering. Tokyo, Japan, July, 1977  
 Int. Conf. Soil Mech. Found. Eng., Proc. 9, 143-192p., 1978  
 CODEN: PCSMB2 25 REFS.  
 Subfile: B  
 Country of Pub.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Illustrations: tables, sects.  
 Descriptors: \*soil mechanics; \*foundations; \*dams; \*nuclear facilities; methods; mathematical methods; theoretical studies; finite element analysis; statistical methods; applications; deformation; Europe; seismic response; mathematical models; models; Canada; stress; automatic data processing  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957990 80-01947

**Numerical analysis of stress path under multidimensional consolidation**

Akai, K.; Tamura, T.

**Proceedings of the speciality session on computers in soil mechanics: Present and future**

Schiffman, R. L. (EDITOR)

Ninth international conference on soil mechanics and foundation engineering. Tokyo, Japan, July, 1977  
Int. Conf. Soil Mech. Found. Eng., Proc., 9, 30-53p., 1978

CODEN: PCSMB2 12 REFS.

Subfile: B

Country of Publ.: Varies

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: \*soil mechanics ; theoretical studies ; stress; numerical analysis; finite element analysis; statistical methods; consolidation; clay; elastic sediments ; plasticity; failure; dilatancy; deformation; automatic data processing

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957558 79-39299

**A computer model for the behaviour of London Clay**

Simpton, B.; O'Riordan, N. J.; Croft, D. D.

Geotechnique 29: 2, 149-175p., 1979

CODEN: GTNDAB ISSN: 0016-8505 25 REFS.

Subfile: B

Country of Publ.: United Kingdom

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English Summary Languages: French

illus.

Descriptors: \*England; \*soil mechanics ; engineering geology; deformation ; excavations; Europe; London; British Library; stress; strain; computers; automatic data processing; London Clay; elastic materials; plastic materials; elastoplastic materials; site exploration; non-linear analysis; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957449 79-39203

**The relation between subsoil condition and the collapse rate of wooden houses due to the Great Kanto earthquake of 1923 in Yokohama City**

Matsuda, I.; Wada, S.; Miyano, M.

J. Geogr. (Tokyo) 87: 5.3(827), 14-23p., 1978

CODEN: CGZAAL 12 REFS.

Subfile: B

Country of Publ.: Japan

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: Japanese Summary Languages: English

illus.. sketch maps

Latitude: N353000; N353000 Longitude: E1393000; E1393000

Descriptors: \*Japan ; engineering geology ; earthquakes; Asia; Honshu; Yokohama; Kanagawa; 1923; Great Kanto

earthquake; Kanto Plain; damage; effects; least-squares

analysis; statistical methods; statistical analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957285 79-39064

**Uncertainty analysis of settlement rate**

El-Moursi, H. H.; Corotis, R. B.; Krizek, R. J.

Soil Test. Serv. Iowa, Cedar Rapids, Iowa, USA; Northwestern Univ., USA

**Soil mechanics; rutting in asphalt pavements, embankments on varied clays, and foundations**

Transp. Res. Rec. 616, 81-84p., 1976

CODEN: TRREDM 2 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus.. table

Descriptors: \*soil mechanics ; settlement ; rates; compression; loading; consolidation; compressibility;

homogeneous media; statistical analysis; probability

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

957284 79-39153

**Design approach for circular buried conduits**

Kay, J. M.; Abel, J. F.  
Cornell Univ., Sch. Civ. Environ. Eng., Ithaca, N.Y., USA

**Soil mechanics; rutting in asphalt pavements, embankments on**

**varved clays, and foundations**

Transp. Res. Rec. 616. 78-79p. 1976

CODEN: TRERDM 4 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

Descriptors: underground installations; design; finite

element analysis; conduits; statistical methods; graphical

techniques; deformation; flexibility; compressibility;

compression; response; stress; in situ; fill

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

955423 79-39070

**Elastoplastic analysis of stresses in coal pillars by finite**

**element method**

Frolov, A. B.; Abdyl'dayev, E. K.

Rock Mech. (Vienna) 11: 4. 243-251p. 1979

CODEN: RHMWAS ISSN: 0035-7448 5 REFS.

Subfile: B

Country of Publ.: International

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English Summary Languages: German

Descriptors: rock mechanics; underground installations;

theoretical studies; stress; finite element analysis;

statistical methods; elastoplasticity; mathematical methods;

pillars; loading; deformation; failure

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

954613 79-39275

**Zależność postępy rozdrabniania a predkoscia przejścia**

**fall ultradźwiękowej podziemnej dla próbek niektórych skał**

**Relation between size reduction and velocity of travel of a**

**longitudinal ultrasonic wave through samples of certain rocks**

Samulico, J. S.

Gornictwa Staszyczna Nr 680. 57-68p. 1978

CODEN: GORNOL 10 REFS.

Subfile: B

Country of Publ.: Poland

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: Polish Summary Languages: English

Tables

953420 79-35047

**Some aspects of three dimensional and two dimensional rock**

**slope stability analyses with two case histories**

Steffen, D. K. W.

Univ. of Witwatersrand, ZAF

unknownp. 1978

Subfile: B

Degree Level: Doctoral

Country of Publ.: South Africa

Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Languages: English

Availability: Univ. Microfilms

Latitude: S350000. S220000 Longitude: E0330000. E0160000

Descriptors: slope stability; mining geology; rock

mechanics; field studies; production control; applications

; open-pit mining; case studies; South Africa; Africa;

Zambia; two-dimensional models; models; three-dimensional

models; statistical methods; theoretical studies

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

953419 79-35044

**An analysis of rock properties and geological**

**discontinuities on colliery roadway stability**

Lackey, S. F.

Univ. of New South Wales, AUS

unknownp. 1976

Subfile: B

Degree Level: Doctoral

Country of Publ.: Australia

Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Languages: English

Availability: Univ. Microfilms

Descriptors: mining geology; underground installations;

rock mechanics; production control; mines; deformation;

roof control; stability; stress; finite element analysis;

statistical methods; coal; organic residues; roadways;

discontinuities

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

953417 79-35046  
**Earth pressures on conduits and retaining walls**  
 Grigley, D. W.  
 Univ. of California, Berkeley, Calif., USA  
 419p., 1978  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Pub.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*soil mechanics; earth pressure; prediction  
 design; automatic data processing; finite element  
 analysis; statistical methods; conduits; walls;  
 theoretical studies: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

953309 79-35199  
**Creep stress analysis of frozen soils under multiaxial states of stress**  
 Klein, J.; Jessberger, H. L.  
**Ground freezing**  
 Jessberger, H. L. (EDITOR)  
 First international symposium on ground freezing.  
 Germany, Federal Republic of, March 8-10, 1978  
 Eng. Geol. 13 1-4. 353-365p., 1979  
 CODEN EGGDAD ISSN: 0013-7952 5 REFS.  
 Subfile: B  
 Country of Pub.: International  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Illus.  
 Descriptors: \*soil mechanics; \*deformation; \*frost action;  
 theoretical studies; creep; ground freezing; artificial  
 freezing; experimental studies; compression; mathematical  
 models; stress; automatic data processing  
 methods: 13 1-4. 299-309p., 1979  
 CODEN EGGDAD ISSN: 0013-7952 10 REFS.

953303 79-35179  
**Effect of freeze-thaw cycles on resilient properties of fine-grained soils**  
 Johnson, F. C.; Cole, D. M.; Chamberlain, E. J.  
 U. S. Army Cold Reg. Res. and Eng. Lab., Hanover, N.H., USA  
**Ground freezing**  
 Jessberger, H. L. (EDITOR)  
 First international symposium on ground freezing.  
 Germany, Federal Republic of, March 8-10, 1978  
 Eng. Geol. 13 1-4. 247-276p., 1979  
 CODEN EGGDAD ISSN: 0013-7952 20 REFS.  
 Subfile: B  
 Country of Pub.: International  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Illus., table  
 Descriptors: \*soil mechanics; \*deformation; \*highways;  
 frost action; experimental studies; elastic properties;  
 ground freezing; laboratory studies; field studies; thawing;  
 cyclic loading; properties; loading; triaxial tests;  
 pavement; stress; fine-grained materials; elastic strain  
 compression; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

953306 79-35370  
**Ice behaviour under load**  
 Zaretsky, Yu. K.; Chumichev, B. D.; Solomatina, V. I.  
**Ground freezing**  
 Jessberger, H. L. (EDITOR)  
 First international symposium on ground freezing.  
 Germany, Federal Republic of, March 8-10, 1978  
 Eng. Geol. 13 1-4. 299-309p., 1979  
 CODEN EGGDAD ISSN: 0013-7952 10 REFS.  
 Subfile: B  
 Country of Pub.: International  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Illus.  
 Descriptors: \*soil mechanics; \*deformation; \*frost action;  
 theoretical studies; creep; ground freezing; artificial  
 freezing; experimental studies; compression; mathematical  
 models; stress; automatic data processing  
 methods: 13 1-4. 299-309p., 1979  
 CODEN EGGDAD ISSN: 0013-7952 10 REFS.

953287 79-35186  
**Frost heave of unsaturated loamy soil under field conditions**  
 Karlov, V. D.

**Ground freezing**  
 Jessberger, H. L. (EDITOR)  
 First International Symposium on ground freezing. Rochnum, Germany, Federal Republic of, March 8-10, 1978  
 Eng. Geol. 13: 1-4, 53-62p., 1979  
 CODEN: EGGDAA ISSN: 0013-7952 3 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: soil mechanics; frost action; frost heaving; ground freezing; moraines; loam; soils; field studies; unsaturated materials; foundations; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

953266 79-35352

**An approach to seismic zoning in southern New England**  
 Whitdo, P. G.  
 U. S. Soil Conserv. Serv., Campaign, III., USA  
 Assoc. Eng. Geol. Bull. 16: 2, 267-286p., 1979  
 CODEN: ENGEA9 ISSN: 0004-5691 39 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, sketch maps  
 Latitude: N410000 Longitude: W0750000  
 Descriptors: New England; seismology; engineering geology; seismicity; earthquakes; zoning; United States; epicenters; distribution; damage; seismic risk; geologic hazards; regression analysis; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

953147 79-31267

**Seismic risk in Fennoscandia**  
 Baath, M.  
 Tectonophysics 57: 2-4, 285-295p., 1979  
 CODEN: TECTOAM ISSN: 0040-1951 10 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, sketch map  
 Latitude: N543000 Longitude: E0320000; E0650000

952967 79-35947

**3D mine pillar design information from 2D FEM analysis**  
 Pariseau, W. G.; Sorensen, W. K.  
 Univ. Utah, Salt Lake City, Utah, USA: Cont. Oil Co., USA  
 Int. J. Numer. Anal. Methods Geomech. 3: 2, 145-157p., 1979  
 ISSN: 0363-9061 9 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, sects.  
 Descriptors: mining geology; engineering geology; finite element analysis; three-dimensional models; methods; two-dimensional models; stress; plane stress; plane strain; coal; organic residues; mines; loading  
 Section Headings: 26 (ECONOMIC GEOLOGY, GENERAL & MINING)

952966 79-35250

**Observed and predicted test pile behaviour**  
 Ottaviani, M.; Marchetti, S.  
 Int. J. Numer. Anal. Methods Geomech. 3: 2, 131-143p., 1979  
 ISSN: 0363-9061 11 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: foundations; soil mechanics; piles; loading; cohesive materials; load cells; finite element analysis; statistical methods; deformation; settlement; stress; shear stress; failure; experimental studies; shear strength  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

951163 79-35241  
**Computer modelling of rock fracture in uniaxial compression**  
 Nishimatsu, Y.; Okubo, S.  
 Tokyo, Univ. Fac. Eng. J., Ser. A 16, 54-55p., 1978  
 CODEN JETAOK 3 REFS.  
 Subfile B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus.  
 Descriptors: rock mechanics; loading; uniaxial tests;  
 failure; fractures; genesis; finite element analysis;  
 statistical methods; compression; heterogeneous materials;  
 models; strain; displacements; mathematical models;  
 computers; data handling  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

950962 79-35075  
**Macroseismic aspects and seismological and statistical considerations**  
 Bastini, M.; Iaccarino, E.; Tenaglia, G.  
**Special issue: Proceedings of the international meeting on the Friuli earthquake: Part 1, Seismology, geophysics, geology**  
 Finetti, I. (EDITOR); Morelli, C. (EDITOR)  
 International meeting on the Friuli earthquake. Udine, Italy, December 4-5, 1976  
 Boll. Geofis. Teor. Appl. 19: 72, 349-355p., 1976  
 CODEN BGTAAE ISSN: 0006-6729  
 Subfile B  
 Country of Publ.: Italy  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N363000 Longitude: E0190000; E0063000  
 Descriptors: Italy; seismology; engineering geology; earthquakes; nuclear facilities; intensity; Europe; design; seismic response; parameters; dispersion  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

950224 79-35221  
**Recognition of faults in Tertiary-Quaternary alluvium in northern Yucca Flat, Nevada**  
 McKague, H. L.; Grothaus, B.; Howard, N. W.; Lawrence Livermore Lab., Livermore, Calif., USA; Univ. S. Cal., USA  
 The Geological Society of America, Cordilleran Section, 75th Annual Meeting, San Jose, Calif., United States, April 9-11, 1979  
 Geol. Soc. Am., Abstr. Programs 11: 3, 91p., 1979  
 CODEN GAATBC ISSN: 0016-7592

Subfile B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N365500 Longitude: W1155500; W1162000  
 Descriptors: Nevada; faults; engineering geology; distribution; geologic hazards; alluvium; Nye County; United States; Nevada Test Site; Yucca Flat; Tertiary; Cenozoic; Quaternary; elastic sediments; site explorations; nuclear facilities; explosions; underground explosions; nuclear explosions; identification; statistical methods; photogeology; geophysical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

949939 79-34506  
**Seismotectonics of the Beaufort Sea**  
 Hasegawa, H. S.; Chou, C. W.; Basham, P. W.; Earth Phys. Branch, Ottawa, Ont., CAN  
 Drury, S. A.  
 Can. J. Earth Sci. 16: 4, 816-830p., 1979  
 CODEN CJESAP ISSN: 0008-4077 46 REFS.  
 Subfile B  
 Country of Publ.: Canada  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Note: Can., Earth Phys. Branch; Contrib. No. 764, illus., tables, sketch maps  
 Latitude: N690000 Longitude: W0260000; W1460000  
 Descriptors: Arctic Ocean; seismology; North America; Canada; Alaska; seismicity; tectonophysics; engineering geology; earthquakes; seismotectonics; plate tectonics; geologic hazards; Beaufort Sea; epicenters; data; continental slope; stress; cluster analysis; statistical methods; gravity anomalies; elastic waves; spectral analysis; Arctic region; United States; seismic risk  
 Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

949557 79-35316  
Transient phenomena of offshore foundations  
Smith, I. M.  
Numerical methods in offshore engineering  
Zienkiewicz, O. C. (EDITOR); Lewis, R. W. (EDITOR); Stagg, K. G. (EDITOR)  
Publ.: John Wiley & Sons  
483-513p., 1978  
3R REFS.  
Country of Publ.: United Kingdom  
Subfile: B  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
A Wiley-Interscience publ., illus., tables  
Descriptors: \*foundations; \*soil mechanics; \*design; \*offshore; \*mathematical methods; \*finite element analysis; \*statistical methods; \*pore pressure; \*cyclic loading; \*theoretical studies; \*piles; \*engineering geology; \*methods; \*physical models; \*models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

949554 79-34952  
Analysis of consolidation of earth and rockfill dams; appendices C-E: user's manual for computer program CON2D for the finite element analysis of consolidation in zoned dams  
Cheng, C. S.; Duncan, J. M.  
Univ. Calif.; Coll. of Eng., Off. of Res. Serv., Berkeley, Calif., USA  
86p., 1977  
Subfile: B  
Doc Type: REPORT Bibliographic Level: MONOGRAPHIC  
Languages: English  
Report No.: TE 77-3, Vol. 2  
Availability: U. S. Army Eng. Waterw. Exp. Stn., Soils and Pavements Lab., Vicksburg, Miss., United States  
tables  
Descriptors: \*soil mechanics; \*dams; \*automatic data processing; \*materials; \*properties; \*foundations; \*engineering geology; \*consolidation; \*earthdams; \*stress; \*strain; \*instruments; \*rockfill dams; \*saturation; \*finite element analysis; \*statistical methods; \*materials; \*properties; \*manuals; \*programs  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

949556 79-35161  
Some application of numerical methods to the design of offshore gravity structure foundations  
Hobbs, R.; George, P. J.; Mustoe, C. G. W.  
Numerical methods in offshore engineering  
Zienkiewicz, O. C. (EDITOR); Lewis, R. W. (EDITOR); Stagg, K. G. (EDITOR)  
Publ.: John Wiley & Sons  
453-482p., 1978  
32 REFS.  
Subfile: B  
Country of Publ.: United Kingdom  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
A Wiley-Interscience publ., illus., tables  
Descriptors: \*foundations; \*marine installations; \*design; \*offshore; \*mathematical methods; \*finite element analysis; \*statistical methods; \*pore pressure; \*cyclic loading; \*theoretical studies; \*piles; \*engineering geology; \*methods; \*physical models; \*models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

949554 79-35372  
A unified approach to the soil mechanics problems of offshore foundations  
Zienkiewicz, O. C.; Norris, V. A.; Winnicki, L. A.; Naylor, D. J.; Lewis, R. W.  
Numerical methods in offshore engineering

949554 79-35372  
A unified approach to the soil mechanics problems of offshore foundations  
Zienkiewicz, O. C.; Norris, V. A.; Winnicki, L. A.; Naylor, D. J.; Lewis, R. W.  
Numerical methods in offshore engineering

949554 79-35372  
A unified approach to the soil mechanics problems of offshore foundations  
Zienkiewicz, O. C.; Norris, V. A.; Winnicki, L. A.; Naylor, D. J.; Lewis, R. W.  
Numerical methods in offshore engineering

948861 79-31398  
**Prediction of undrained behavior of sand**  
 Lamp, P. V.  
 Am. Soc. Civ. Eng., Proc., J. Geotech. Eng. Div., 104: Gf6, 721-73p., 1978  
 CODEN: AJGEB6 ISSN: 0093-6405 28 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table  
 Descriptors: soil mechanics; materials; properties; sand; materials, properties; clastic sediments; saturated materials; granular materials; pore pressure; finite element analysis; statistical methods; models; stress; strain; strength; cohesionless materials; elastoplastic materials  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

947570 79-31347  
**Evaluation of the anisotropic behaviour of brazilian test discs by the finite element method**  
 Gowd, T. N.; Tulas, V. S.  
 Geophys. Res. Bull. (Hyderabad) 16: 1, 57-73p., 1978  
 CODEN: GREUDH 18 REFS.  
 Subfile: B  
 Country of Publ.: India  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: rock mechanics; materials; properties; anisotropic materials; materials, properties; Brazil tests; finite element analysis; statistical methods; anisotropy; composition; tensile strength; layered media; stress; loading; mathematical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

948231 79-25497  
**Tables of room temperature electrical properties for selected rocks and minerals with dielectric permittivity statistics**  
 Dhoerft, G. R.  
 U. S. Geol. Surv., Open-File Rep. 79-993, 24p., 1979  
 CODEN: XGRDAG  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL: REPORT Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: U. S. Geol. Surv., Open-File Serv., Sect., Branch Distrib., Denver, Colo., United States  
 tables  
 Descriptors: rock mechanics; materials; properties; electrical properties; minerals; rocks; dielectric properties; statistical analysis; materials; properties; data; temperature; room temperature  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

947728 79-31547  
**Stability of continental shelf and slope off Louisiana and Texas: geotechnical aspects**  
 Watkins, D. J.; Kraft, L. M., Jr.  
 Serata Geomech., Berkeley, Calif., USA; McClelland Eng., USA  
**Framework, facies, and oil-trapping characteristics of the upper continental margin**  
 Brumba, A. H. (EDITOR); Moore, G. T. (EDITOR); Coleman, J. M. (EDITOR)  
 Am. Assoc. Pet. Geol., Stud. Geol. 7, 267-286p., 1978  
 CODEN: ASGED3 ISBN: 0891810110 28 REFS.

946935 79-31486

**Application of the initial stress method to soil-structure interaction**

Rove, R. K.; Booker, J. R.; Rataam, N. P.  
Int. J. Numer. Methods Eng. 12: 5, 873-880p., 1978  
CODEN: JUMREH ISSN: 0029-5981 10 REFS.

Subfile: B

Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
illus., tables

Descriptors: soil mechanics; theoretical studies;  
stress; finite element analysis; statistical methods;  
mathematical methods; foundations; plastic failure; shear  
strength; applications.  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

944904 79-28337

**Application of unsaturated flow properties in the design of geologic environments for radioactive waste storage facilities**

Frind, E. O.; Gillham, R. W.; Pickens, J. F.  
Univ. Waterloo, Dep. Earth Sci., Waterloo, Ont., CAN

**Finite elements in water resources; proceedings of the first international conference**

Gray, W. G. (EDITOR); Pinder, G. F. (EDITOR); Brebbia, C. A. (EDITOR)  
First international conference on finite elements in water resources, Princeton, N.J., United States, July 12-16, 1976

Publ: Pentech Press  
P. 3, 133-3, 163p., 1977  
ISBN: 0727306014 8 REFS.

Subfile: B

Country of Publ.: United Kingdom  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
illus., tables, sects.

Descriptors: waste disposal; methods; unsaturated materials; soil mechanics; granular materials; storage; radioactive materials; finite element analysis; statistical methods; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

944804 79-28315

**Immiscible flow by finite elements**

Dalen, V.

**Finite elements in water resources; proceedings of the first international conference**

Gray, W. G. (EDITOR); Pinder, G. F. (EDITOR); Brebbia, C. A. (EDITOR)  
First international conference on finite elements in water resources, Princeton, N.J., United States, July 12-16, 1976

Publ: Pentech Press  
P. 3, 69-3, 90p., 1977  
ISBN: 0727306014 18 REFS.

Subfile: B

Country of Publ.: United Kingdom  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
illus.

Descriptors: engineering geology; ground water; petroleum engineering; movement; immiscible fluids; porous media; finite element analysis; statistical methods; porosity; hydrocarbons; organic materials; recovery; numerical analysis; mathematical models; one-dimensional models; two-dimensional models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

944756 79-28404

**Settlement of footings on compacted clays**

Ramaswamy, S. V.; Vaidyanathan, R.

**International symposium on soil structure interaction**

Jain, D. P. (chairperson)  
International symposium on soil-structure interaction, Roorkee, India, Jan 3-7, 1977

Publ: Sarita Prakashan  
251-257p., 1977

6 REFS.

Subfile: B

Country of Publ.: India  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
illus., sect.

Descriptors: foundations; soil mechanics; structures; settlement; footings; consolidated materials; clays; saturated materials; creep; finite element analysis; statistical methods; cohesive materials; shear; strain; elastoviscous materials  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

944755 79-28422

**Finite element analysis of the behaviour of dilatant soils**

Vallabhan, C. V. G.; Raghun, D.  
 Tex. Tech Univ., Civ. Eng. Dep., Lubbock, Tex., USA;  
 Tri-State Univ., USA

**International symposium on soil structure interaction**

Jain, D. P. (chairperson)  
 International symposium on soil-structure interaction,  
 Roorkee, India, Jan 3-7, 1977  
 Publ. Sarita Prakashan  
 189-195p., 1977  
 16 REFS.

Subfile: B  
 Country of Publ.: India  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.

Descriptors: soil mechanics; materials; properties;  
 dilatant materials; materials, properties; dilatancy;  
 finite element analysis; statistical methods; sand; clastic  
 sediments; models; stress; triaxial tests; compression  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

944496 79-28250

**A comparison between measured and computed response of Yuda Dam during the July 8, 1978 earthquake; northern Japan**

Matsumoto, N.  
 Bur. Reclam., Dams Branch, Denver, Colo., USA  
 43p., 1978  
 7 REFS.

Subfile: B  
 Doc Type: REPORT Bibliographic Level: MONOGRAPHIC

Languages: English  
 Report No.: RFC ERC-78-4  
 illus., plate, tables  
 Latitude: N290000; N413000 Longitude: E1420000; E1380000  
 Descriptors: Japan; engineering geology; earthquakes;  
 dams; Asia; seismic response; 1976; Yuda Dam; loading;  
 theoretical studies; finite element analysis; statistical  
 methods; mathematical methods; models; accelerograms;  
 seismographs; velocity; epicenters  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

943543 79-28406

**Application of an experimentally based non-linear constitutive model of soils in laboratory and field tests**

Richards, B. G.  
 Aust. Geomech. J. 68, 20-30p., 1978  
 CODEN: AUGJEU ISSN: 0313-4458 12 REFS.

Subfile: B  
 Country of Publ.: Australia  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: soil mechanics; theoretical studies;  
 models; experimental studies; field studies; applications;  
 modified variable moduli model; cohesionless materials;  
 clays; materials, properties; tests; mathematical models;  
 finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

943415 79-25734

**Earthquake risk in New Zealand; statistical estimates**

Smith, W. D.  
 N. Z. J. Geol. Geophys. 21: 3, 313-327p., 1978  
 CODEN: NZOJAY ISSN: 0028-8306 15 REFS.

Subfile: B  
 Country of Publ.: New Zealand  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 tables, sketch maps  
 Latitude: S473000; S343000 Longitude: E1783000; E1663000  
 Descriptors: New Zealand; engineering geology;  
 earthquakes; Australasia; urban planning; modified Mercalli  
 scale; intensity; acceleration; shallow-focus earthquakes  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

943179 79-25471

**Methods for reducing undrained shear strength of soft clay**

Helenelund, K. V.  
 Statens Geotek. Inst., Rapp.--Swed. Geotech. Inst., Rep. 3,  
 50p., 1977  
 65 REFS.

Subfile: B  
 Country of Publ.: Sweden  
 Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 illus., tables  
 Latitude: N551500; N691500 Longitude: E0241500; F0110000  
 Descriptors: Sweden; soil mechanics; engineering geology;  
 materials; properties; clays; shear strength; methods;  
 materials, properties; clays; Europe; failure; collapsible  
 materials; statistical methods; mathematical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

DIALOG FILES: GEOREF - 61-82/Sep (Copr. American Geological Institute) (Item 671 of 1356) User 5208 2sep82

942246 79-25591

**Automatic identification and evaluation of geotechnics**

**zones for fill**  
 Cubitt, J. M.; Andrews, D. E.; Dennis, B.  
 Syracuse Univ., Dep. Geol., Syracuse, N.Y., USA  
 Assoc. Eng. Geol., Bull., 15: 4, 355-374p., 1978  
 CODEN: ENGEA9 ISSN: 0004-5691 7 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table, geol. sketch map  
 Latitude: N520000 Longitude: W0004500  
 Descriptors: \*England; \*soil mechanics; \*sediments;  
 \*automatic data processing; \*engineering geology; materials;  
 properties; clastic sediments; geologic hazards; fill;  
 statistical analysis; Europe; Milton Keynes; engineering  
 properties; materials; properties; classification; site  
 exploration; foundations; principal components analysis;  
 cluster analysis; statistical methods; contour maps; maps;  
 urban planning  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

939516 79-22721

**Ground movements associated with the failure of a tunnel lining in the London Clay**  
 Kengh, G. S.; Scott, C. R.

**Large ground movements and structures**  
 Gedes, J. D. (EDITOR)  
 Large ground movements and structures. Cardiff, Wales.  
 United Kingdom, July 4-7, 1977  
 Publ.: John Wiley & Sons  
 411-423p., 1978  
 ISBN: 0470264608 9 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 A Halsted Press Book, illus.  
 Latitude: N513000 Longitude: E0000000; W0001000  
 Descriptors: \*England; \*soil mechanics; \*engineering  
 geology; case studies; tunnels; land subsidence;  
 settlement; Europe; Hertfordshire; Hertford; Cuffley;  
 Penisbourne Tunnel; failure; theodolites; strength;  
 undrained materials; triaxial tests; stress; earth  
 pressure; stiffness; Young's modulus; elastic constants;  
 cores; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

939515 79-22677

**Creep movements associated with excavations in rock**  
 Emery, J. J.; Hanafy, E. A.; Franklin, J. A.  
 McMaster Univ., Dep. Civ. Eng. Mech., Hamilton, Ont., CAN

**Large ground movements and structures**  
 Geddes, J. D. (EDITOR)  
 Large ground movements and structures. Cardiff, Wales.  
 United Kingdom, July 4-7, 1977  
 Publ.: John Wiley & Sons  
 387-410p., 1978  
 ISBN: 0470264608 28 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 A Halsted Press Book, illus., tables  
 Descriptors: \*rock mechanics; \*tunnels; excavations;  
 creep; simulation; plane strain; displacements; finite  
 element analysis; statistical methods; stress; case studies  
 ; Ontario; Canada; limestone; carbonate rocks; shale;  
 clastic rocks; elasticity; isotropic materials; orthotropic  
 materials; uniaxial tests; Poisson's ratio; elastic  
 constants  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

9395/5 79 22821

**Analysis and prediction of ground subsidence due to coal mine entry collapse**

Stephenson, R. W.; Aughenbaugh, N. B.  
Univ. Missouri, Dep. Civ. Eng., Rolla, Mo., USA

**Large ground movements and structures**

Geddes, J. D. (EDITOR)  
Large ground movements and structures. Cardiff, Wales, United Kingdom, July 4-7, 1977  
Publ. John Wiley & Sons  
100-119p., 1978  
ISBN: 0470264608 7 REFS.

Subfile B  
Country of Publ.: United States  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
A Halsted Press Book, illus., table, sects., sketch maps  
Latitude: N375100 Longitude: W0885200; W0885600  
Descriptors: Illinois; engineering geology; land subsidence; Williamson County; Herrin No. 6 Coal County; United States; Johnston City; coal; organic residues; mines; Washington Elementary School; damage; structures; statistical analysis; Lake Creek Mine; room and pillar mining; Herrin No. 6 Coal; boreholes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

939467 79 22787

**Some studies of soil-structure interaction on a footing resting on soft clay**

Raghu, D.  
Tri-State Univ., Angola, Indiana, USA

**Geotechnical aspects of soft clays**

Brenner, R. P. (EDITOR); Brand, E. W. (EDITOR)  
International symposium on soft clay. Bangkok, Thailand, July 5-6, 1977  
Publ. Asian Inst. Technol.  
691-701p., 1977  
4 REFS.

Subfile B  
Country of Publ.: Thailand  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: foundations; soil mechanics; stability; deformation; footings; soft clays; models; finite element analysis; statistical methods; stress; bearing capacity  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

939463 79-22666

**Elastic-plastic, large deformation response of soft clay to footing load**

Davidson, H. L.; Chen, W. F.  
GAI Consult., Monroeville, Pa., USA

**Geotechnical aspects of soft clays**

Brenner, R. P. (EDITOR); Brand, E. W. (EDITOR)  
International symposium on soft clay. Bangkok, Thailand, July 5-6, 1977  
Publ. Asian Inst. Technol.  
629-646p., 1977  
21 REFS.

Subfile B  
Country of Publ.: Thailand  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: soil mechanics; foundations; deformation; stability; soft clays; footings; loading; elastic materials; plastic materials; models; finite element analysis; statistical methods; stress; strain; displacements; examples  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

939453 79-22657  
**Cracking and progressive failure of embankments on soft clay foundations**  
 Chirapuntit, S.; Duncan, J. M.  
 Univ Calif., Berkeley, Calif., USA

**Geotechnical aspects of soft clays**  
 Brenner, R. P. (EDITOR); Brand, E. W. (EDITOR)  
 International symposium on soft clay. Bangkok, Thailand, July 5-6, 1977  
 Publ. Asian Inst. Technol. 453-470p., 1977  
 17 REFS.  
 Subfile: B  
 Country of Publ.: Thailand  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*slope stability; \*soil mechanics; \*foundations  
 ; embankments; materials; properties; stability ; failure; soft clays; materials, properties; stress; strain ; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

939451 79-22638  
**Instrumentation du remblai experimental 'A' de Cubzac-les-Ponts**  
**Instrumentation of the experimental embankment 'A' at Cubzac-les-Ponts**  
 Blondeau, F.; Mieussens, C.; Queyrol, D.; Levillain, J. P.; Peignaud, M.; Voglien, M.

**Geotechnical aspects of soft clays**  
 Brenner, R. P. (EDITOR); Brand, E. W. (EDITOR)  
 International symposium on soft clay. Bangkok, Thailand, July 5-6, 1977  
 Publ. Asian Inst. Technol. 419-475p., 1977  
 7 REFS.  
 Subfile: B  
 Country of Publ.: Thailand  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: French  
 illus  
 Latitude: N423000; Longitude: E0083000; W0050000  
 Descriptors: \*france; \*soil mechanics ; engineering geology ; experimental studies ; slope stability; soft clays ; Europe; Bordeaux; Dordogne River; foundations; organic materials; embankments; compressibility; instruments; finite element analysis; statistical methods; elasticity; plasticity  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

939443 79-22800  
**Surcharge fill settlements on soft clay at the location of two air cooling towers**  
 Sanglerat, G.; Soulier, L.; Doussot, M.; Bardot, F.; Cambot, B.; Touret, J. P.

**Geotechnical aspects of soft clays**  
 Brenner, R. P. (EDITOR); Brand, E. W. (EDITOR)  
 International symposium on soft clay. Bangkok, Thailand, July 5-6, 1977  
 Publ. Asian Inst. Technol. 285-300p., 1977  
 10 REFS.  
 Subfile: B  
 Country of Publ.: Thailand  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., sects.  
 Descriptors: \*foundations; \*soil mechanics ; structures; materials; properties ; cooling towers; soft clays; materials, properties; power plants; elasticity; plasticity ; overconsolidated materials; finite element analysis; statistical methods; settlement; penetration tests  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

939201 79-22604  
**Elasto-plastic finite element analyses of passive earth pressure tests**  
 Wong, K. S.  
 Univ. of California, Berkeley, Calif., USA  
 400p., 1978  
 Subfile: B

Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*soil mechanics ; earth pressure ; models; sand; clastic sediments; finite element analysis; statistical methods; theoretical studies; mathematical models; experimental studies; elasticity; plasticity; failure; strain  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

937200 79-22597  
 Mysore, R. K.  
 State Univ. of New York, Buffalo, Amherst, N.Y., USA  
 149p., 1978  
 Subfile: B

**Finite element analysis of sand as a hypoelastic material**

Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*soil mechanics; materials; properties; sand; materials, properties; clastic sediments; theoretical studies; mathematical models; models; finite element analysis; statistical methods; granular materials; elasticity; hypoelasticity; elastic properties; automatic data processing; stress  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

939198 79-22593

**A numerical solution for the stresses and deformations in a pseudo-elastic soil system**

Kasim, A. G.  
 Univ. of California, Berkeley, Calif., USA  
 319p., 1978  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Descriptors: \*soil mechanics; \*deformation; theoretical studies; stress; strain; elasticity; pseudoeasticity; mathematical models; models; finite element analysis; statistical methods; numerical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

937914 79-19483

**Loi rhéologique incrementale pour les sols et application par la méthode des éléments finis**  
**Incremental rheological law for soils and applications by the finite elements method**

Boulon, M.; Chambon, R.; Darve, F., 1977  
 Rev. Fr. Geotech., 2, 5-21p., 1977  
 20 REFS.  
 Subfile: B  
 Country of Publ.: France  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: French  
 Illustrations: tables  
 Descriptors: \*mathematical geology; \*soil mechanics;

Methods: concepts; finite element analysis; statistical methods; applications  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

937221 79-19627

**Application of the statistical method in control of compaction of soils**

Guedes Soares, F. F.  
 Specialty session 2: Soil sampling  
 Hoshino, K. (EDITOR)  
 Ninth international conference on soil mechanics and foundation engineering, Tokyo, Japan, July 11, 1977  
 Int. Conf. Soil Mech. Found. Eng., Proc., 9, Volume 1, 109-113p., 1977  
 CODEN: PCSMB2 9 REFS.

Subfile: B  
 Country of Publ.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Illustrations: table  
 Descriptors: \*soil mechanics; applications; statistical methods; engineering geology; compaction; methods; equations; site exploration; Caia Dam; soils  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

937198 79-19887

**Specialty Session 6: The probabilistic approach to soil mechanics design**

Schulitze, E.  
 Ninth international conference on soil mechanics and foundation engineering, Tokyo, Japan, July 11, 1977  
 Int. Conf. Soil Mech. Found. Eng., Proc., 9, Vol. 3, 501-511p., 1977  
 CODEN: PCSMB2 10 REFS.

Subfile: B  
 Country of Publ.: Varies  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Illustrations: tables  
 Descriptors: \*foundations; \*soil mechanics; design; theoretical studies; failure; probability; equations; safety  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

937122 79-19641

**Isolation of vibrations by concrete core walls**

Haupt, W. A.  
Ninth international conference on soil mechanics and foundation engineering, Tokyo, Japan, July 11, 1977  
Int. Conf. Soil Mech. Found. Eng., Proc. 9, Vol. 2, 251-256pp., 1977

CODEN: PCSMR2  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English  
Descriptors: \*foundations ; materials; properties ; retaining walls; theoretical studies; materials, properties; methods; finite element analysis; statistical methods; equations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

937108 79-19989

**The in situ shear behaviour of fissured soils**

Williams, A. A. B.; Jennings, J. E.  
Ninth international conference on soil mechanics and foundation engineering, Tokyo, Japan, July 11, 1977  
Int. Conf. Soil Mech. Found. Eng., Proc. 9, Vol. 2, 169-176p., 1977

CODEN: PCSMR2 18 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English  
Descriptors: \*soil mechanics ; materials; properties ; clays; materials, properties; experimental studies; shear strength; joints; fractures; analysis; failure; finite element analysis; statistical methods (ENGINEERING & ENVIRONMENTAL GEOLOGY)  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

937086 79-19564

**Stability of a deep excavation bottom**

Dolezalova, M.; Mikulaskova, V.; Skoch, V.  
Ninth international conference on soil mechanics and foundation engineering, Tokyo, Japan, July 11, 1977  
Int. Conf. Soil Mech. Found. Eng., Proc. 9, Vol. 2, 47-50 p., 1977

CODEN: PCSMR2 8 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English  
Descriptors: \*foundations ; stability ; excavations; applications; models; mining; mathematical models; finite element analysis; statistical methods; stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

937059 79-19889

**Statistical evaluation of settlement observations**

Schulze, E.; Sievering, W.  
Ninth international conference on soil mechanics and foundation engineering, Tokyo, Japan, July 11, 1977  
Int. Conf. Soil Mech. Found. Eng., Proc. 9, Vol. 1, 711-714p., 1977

CODEN: PCSMB2 9 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English  
Descriptors: \*foundations ; theoretical studies ; settlement; statistical analysis; mathematical methods; data; methods; equations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

937033 79-19708

**Analysis of interference of strip footings by FEM**

Khadilkar, B. S.; Varma, B. S.  
Ninth international conference on soil mechanics and foundation engineering, Tokyo, Japan, July 11, 1977  
Int. Conf. Soil Mech. Found. Eng., Proc. 9, Vol. 1, 597-600p., 1977

CODEN: PCSMB2 8 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English  
Descriptors: \*foundations ; experimental studies ; footings; analysis; methods; finite element analysis; statistical methods; stress; strain; deformation; equations; data  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

936932 79-19565  
**The vane test: a critical appraisal**  
 Donald, I. B.; Jordan, D. D.; Parker, R. J.; Toh, C. T.  
 Ninth international conference on soil mechanics and  
 foundation engineering, Tokyo, Japan, July 11, 1977  
 Int. Conf. Soil Mech. Found. Eng., Proc., 9, Vol. 1, 81-88  
 P., 1977

CODEN: PCSMB2 8 REFS.  
 Subfile: B  
 Country of Publ.: Varies  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*soil mechanics ; applications ; vane tests;  
 methods: clays; equations; techniques; Lanceston; Yarra  
 Delta; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

936796 79-19368  
**Matematicheskiye metody i dostovernost' gidrogeologicheskikh  
 i inzhenerno-geologicheskikh prognozov**  
**Mathematical methods and the reliability of hydrogeological  
 and engineering geology forecasting**  
 Gorokhovskiy, V. M.  
 Publ.: Izd. Nedra  
 75p., 1977  
 47 REFS.  
 Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: BOOK Bibliographic Level: MONOGRAPHIC  
 Languages: Russian  
 illus., tables  
 Descriptors: \*ground water; \*engineering geology ; models;  
 methods ; mathematical models; statistical analysis;  
 mathematical methods; hydrogeology; hydrology  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

936498 79-19407  
**The effect of de-icing agents on water adsorption phenomena  
 in rock aggregates**  
 Rogers, C. A.  
 Univ. of Windsor, Windsor, Ont., CAN  
 unknownp., 1977  
 Subfile: B  
 Degree Level: Master's  
 Country of Publ.: Canada  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Latitude: N420000; N570000 Longitude: W0740000; W0950000  
 Descriptors: \*rock mechanics ; frost action ; mechanism;

936964 79-19561  
**A statistical model of anisotropic fragmentation**  
 Dienes, J. K.; Margolin, L. G.  
**Explosively produced fracture of oil shale; April-June 1978**  
 Carter, W. J.(COMPILER)  
 Los Alamos Sci. Lab., [Rep.] 7438, 11-17p., 1978  
 CODEN: LASLCA  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL: REPORT Bibliographic Level: ANALYTIC  
 Languages: English  
 Availability: U. S. Dep. Energy, Washington, D.C., United  
 States  
 illus.  
 Descriptors: \*rock mechanics ; theoretical studies ;  
 fractures; oil shale; statistical analysis; models;  
 anisotropy; failure; strength; stability  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

935342 79-19729  
**Sampling a glacial silty clay**  
 Lamb, J. H.; Ritchie, J. M.  
 Wayne State Univ., Dep. Civ. Eng., Detroit, Mich., USA;  
 Mich. Dep. State Highw. and Transp., USA  
**Soil taxonomy and soil properties**  
 Transp. Res. Rec., 642, 53-56p., 1977  
 CODEN: TRREDM 6 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Latitude: N421500; N423500 Longitude: W0831500; W0832500  
 Descriptors: \*Michigan; \*soil mechanics ; engineering  
 geology; methods ; statistical methods; United States;  
 clay; clastic sediments; site exploration; sampling;  
 moisture; undrained shear strength; design; Detroit  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

936498 79-19407  
**The effect of de-icing agents on water adsorption phenomena  
 in rock aggregates**  
 Rogers, C. A.  
 Univ. of Windsor, Windsor, Ont., CAN  
 unknownp., 1977  
 Subfile: B  
 Degree Level: Master's  
 Country of Publ.: Canada  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Latitude: N420000; N570000 Longitude: W0740000; W0950000  
 Descriptors: \*rock mechanics ; frost action ; mechanism;

933731 79 16250  
**CMPEEF's views on earthquake-resistant design of earth dams**  
 Anton, W. F.  
 East Bay Munic. Util. Dist., Oakland, Calif., USA  
 Am. Soc. Civ. Eng., Proc., J. Geotech. Eng. Div., 105: GT1,  
 85-88p., 1979  
 CODEN: AJGEB6  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: dams; associations; design; engineering  
 geology; seismic response; California Water Power  
 Earthquake Engineerin; stability; finite element analysis;  
 statistical methods; techniques; programs  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

933588 79-15733  
**Rock stress investigations and the tectonics of Iceland**  
 Voight, B.; Haimson, B. C.; Jefferts, R.; Simon, R.  
 Pa. State Univ., Dep. Geosci., University Park, Pa., USA  
 The Geological Association of Canada, The Mineralogical  
 Association of Canada, The Geological Society of America (91st  
 annual meeting); 1978 joint annual meeting, Toronto, Ont.,  
 Canada, Oct. 23-26, 1978  
 Geol. Soc. Am., Abstr. Programs 10: 7, 510p., 1978  
 CODEN: GAAPBC  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Latitude: N634000 Longitude: W0133000; W0244500  
 Descriptors: Iceland; deformation; rock mechanics;  
 tectonophysics; field studies; plate tectonics; stress;  
 Atlantic Ocean; Europe; hydraulic fracturing; boreholes;  
 rift zones; regional patterns; geothermal systems; finite  
 element analysis; statistical methods  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

935111 79-19805  
**Stress analysis for a non-linear rock structure**  
 Morita, N.  
 Jap. Assoc. Pet. Technol., J. 44: 1, 21-29p., 1979  
 CODEN: SGKVAD 10 REFS.  
 Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 illus., table  
 Descriptors: engineering geology; rock mechanics;  
 petroleum engineering; loading; hydraulic fracturing;  
 stress; finite element analysis; statistical methods;  
 models; applications; strain; boreholes; nonlinear  
 materials  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

935110 79-19806  
**Regression analysis and error evaluation for parameter  
 determination in petroleum engineering problems: (1st report),  
 Error sensitivity analysis for search parameters and predicted  
 performance**  
 Morita, N.; Sugioka, M.; Shima, M.; Inoue, N.  
 Jap. Assoc. Pet. Technol., J. 44: 1, 15-20p., 1979  
 CODEN: SGKVAD 6 REFS.  
 Subfile: B  
 Country of Publ.: Japan  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Japanese Summary Languages: English  
 Descriptors: engineering geology; petroleum engineering  
 ; regression analysis; mathematical models; models;  
 statistical analysis; prediction; accuracy  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

935089 79-19681  
**A finite element method for consolidation of clay**  
 Johnson, C.  
 Comput. Methods Appl. Mech. Eng. 16: 2, 177-184p., 1978  
 CODEN: CMECC 8 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: soil mechanics; materials; properties;  
 clays; materials, properties; finite element analysis;  
 statistical methods; elasticity; plasticity; mathematical  
 models; models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

933490 79-16319

**Engineering evaluation of seabed sediments by cluster analysis**

Denness, B.; Cubitt, J. M.; McCann, D. M.; McQuillin, R.  
Syracuse Univ., Dep. Geol., Syracuse, N.Y., USA

**Recent advances in geomathematics: an international symposium: proceedings of papers presented at sessions sponsored by the International Association for Mathematical Geology at the 25th International Geological Congress in Sydney, Australia, August 1976**

Merriam, D. F. (EDITOR)  
25th International Geological Congress, Sydney, Australia, Aug. 1976  
Comput. Geol. 2, 21-33p., 1978  
14 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC  
Languages: English  
illus., tables, sketch maps  
Latitude: N53000; N56000 Longitude: W005000; W0053000  
Descriptors: \*Scotland; \*sediments; engineering geology; properties; marine installations; engineering properties; Europe; Arran; ocean floors; cluster analysis; statistical methods; materials; properties; pipelines; design; offshore; site exploration  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

933287 79-16587

**Analysis of dynamically loaded structures and foundations**

Smith, I. M.

**Offshore soil mechanics: a course of lectures and practical exercises**

George, P. (EDITOR); Wood, D. (EDITOR)  
Cambridge University course on Offshore soil mechanics, United Kingdom, March 29-April 2, 1976  
Publ.: Cambridge Univ., Dep. Eng. Lloyd's Register of Shipping 251-262p., 1976  
6 REFS.

Subfile: B  
Country of Publ.: United Kingdom  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.

Descriptors: \*marine installations; \*foundations; design; seismic response; mathematical models; gravity platforms; finite element analysis; statistical methods; offshore; soil mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

933284 79-16586

**Quasi-static design of foundations: including structure-foundation interaction**

Smith, I. M.

**Offshore soil mechanics: a course of lectures and practical exercises**

George, P. (EDITOR); Wood, D. (EDITOR)  
Cambridge University course on Offshore soil mechanics, United Kingdom, March 29-April 2, 1976  
Publ.: Cambridge Univ., Dep. Eng. Lloyd's Register of Shipping 307-325p., 1976  
14 REFS.

Subfile: B  
Country of Publ.: United Kingdom  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: \*marine installations; design; gravity platforms; gravity structures; foundations; stability; mathematical models; models; finite element analysis; statistical methods; offshore; physical methods; soil mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Werkle, M.

932267 79-16494  
Statistical analysis of strong-motion acceleration records  
Ohashi, M.; Iwasaki, T.; Wakabayashi, S.; Takida, K.  
Wind and seismic effects  
Lew, H. S. (EDITOR)  
Ninth joint panel conference of the U.S.-Japan Cooperative  
Program in Natural Resources : Wind and seismic effects.  
Tokyo, Japan, May 24-27, 1977  
U. S. Natl. Bur. Stand., Spec. Publ., 523, IV.4B-IV.77p.,  
1978  
CODEN: XNBSAV 10 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
Descriptors: earthquakes ; seismic response;  
effects ; ground motion; strong motion; engineering  
geology ; structures; horizontal acceleration;  
acceleration; stability; design; Japan; Asia  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932277 79-16382  
Numerical methods for the computation of steady-state  
harmonic wave fields  
Haupt, W. A.  
Dynamic response and wave propagation in soils  
Prange, B. (EDITOR)  
Advanced study institute and international conference on  
dynamical methods in soil and rock mechanics, Karlsruhe,  
Germany, Federal Republic of, Sept. 5-16, 1977  
Publ.: A. A. Balkema  
255-280p., 1978  
ISBN: 9061910250 8 REFS.  
Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
Descriptors: soil mechanics ; foundations ; deformation;  
buildings ; loading; response; elasticity; elastic  
constants; elastic properties; settlement; models; finite  
element analysis; statistical methods; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932273 79-16852  
Determination of spring constants in SSI by a finite element  
method  
Dynamic response and wave propagation in soils  
Prange, B. (EDITOR)  
Advanced study institute and international conference on  
dynamical methods in soil and rock mechanics, Karlsruhe,  
Germany, Federal Republic of, Sept. 5-16, 1977  
Publ.: A. A. Balkema  
103-126p., 1978  
ISBN: 9061910250 34 REFS.  
Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
Descriptors: soil mechanics ; foundations ; deformation;  
buildings ; loading; response; elasticity; elastic  
constants; elastic properties; settlement; models; finite  
element analysis; statistical methods; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932268 79-16399  
Dynamic soil-structure interaction  
Holzlochner, U.  
Dynamic response and wave propagation in soils  
Prange, B. (EDITOR)  
Advanced study institute and international conference on  
dynamical methods in soil and rock mechanics, Karlsruhe,  
Germany, Federal Republic of, Sept. 5-16, 1977  
Publ.: A. A. Balkema  
103-126p., 1978  
ISBN: 9061910250 34 REFS.  
Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
Descriptors: soil mechanics ; foundations ; deformation;  
buildings ; loading; response; elasticity; elastic  
constants; elastic properties; settlement; models; finite  
element analysis; statistical methods; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932269 79-16399  
Dynamic response and wave propagation in soils  
Prange, B. (EDITOR)  
Advanced study institute and international conference on  
dynamical methods in soil and rock mechanics, Karlsruhe,  
Germany, Federal Republic of, Sept. 5-16, 1977  
Publ.: A. A. Balkema  
103-126p., 1978  
ISBN: 9061910250 6 REFS.  
Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
Descriptors: soil mechanics ; foundations ; theoretical  
studies ; materials; properties; response; finite element  
analysis; statistical methods; materials; properties;  
spring constants  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932270 79-16399  
Dynamic response and wave propagation in soils  
Prange, B. (EDITOR)  
Advanced study institute and international conference on  
dynamical methods in soil and rock mechanics, Karlsruhe,  
Germany, Federal Republic of, Sept. 5-16, 1977  
Publ.: A. A. Balkema  
103-126p., 1978  
ISBN: 9061910250 6 REFS.  
Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
Descriptors: soil mechanics ; foundations ; theoretical  
studies ; materials; properties; response; finite element  
analysis; statistical methods; materials; properties;  
spring constants  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932260 79-16240

**Influence of embedment of a reactor building on the seismic behaviour**

Altes, J.; Koschmieder, D.

**Rock dynamics and geophysical aspects**

Borm, G. W. (EDITOR)

Advanced study institute and international conference on dynamical methods in soil and rock mechanics, Karlsruhe, Germany, Federal Republic of, Sept 5-16, 1977

Publ. A. A. Balkema

3. 227-236p., 1978

ISBN 9061910269 9 REFS

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: nuclear facilities; underground installations; soil mechanics; earthquakes; design; theoretical studies; seismic response; mathematical methods; methods; finite element analysis; statistical methods; models; mathematical models; acceleration; seismic risk; stability

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932259 79-16411

**Deterministic and probabilistic soil-structure interaction analysis by finite elements; workshop discussion on J. Lysmer's main lecture**

Kausel, E.; Lysmer, J.; Sachs, K.; Roesset, J. M.

**Rock dynamics and geophysical aspects**

Borm, G. W. (EDITOR)

Advanced study institute and international conference on dynamical methods in soil and rock mechanics, Karlsruhe, Germany, Federal Republic of, Sept. 5-16, 1977

Publ. A. A. Balkema

3. 223-226p., 1978

ISBN 9061910269 14 REFS.

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Note: For original reference, see J. Lysmer in Dynamical methods in soil and rock mechanics, 1977.

Descriptors: soil mechanics; methods; mathematical methods; finite element analysis; statistical methods; models

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932257 79-16271

**Numerical analysis of dynamic rock-structure interaction**

Borm, G. W.

**Rock dynamics and geophysical aspects**

Borm, G. W. (EDITOR)

Advanced study institute and international conference on dynamical methods in soil and rock mechanics, Karlsruhe, Germany, Federal Republic of, Sept. 5-16, 1977

Publ. A. A. Balkema

3. 201-215p., 1978

ISBN 9061910269 17 REFS.

Subfile B

Country of Publ.: Netherlands

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.

Descriptors: rock mechanics; methods; mathematical methods; site exploration; models; mathematical models; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932251 79-16379

**Dynamic finite element modeling of near field ground motion from the San Fernando 1971 earthquake**  
Harding, S. T.; Perkins, D.  
U. S. Geol. Surv., Denver, Colo., USA

**Rock dynamics and geophysical aspects**  
Born, G. W. (EDITOR)  
Advanced study institute and international conference on dynamical methods in soil and rock mechanics, Karlsruhe, Germany, Federal Republic of, Sept. 5-16, 1977  
Publ: A. A. Balkema  
3. 67 Bp., 1978  
ISBN 9061910269 23 REFS.  
Subfile: B

Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus: sketch map  
Latitude: N342000; N342000 Longitude: W1183000; W1183000  
Descriptors: \*California; \*engineering geology; earthquakes; United States; 1971; San Fernando; models; ground motion; mathematical methods; mathematical models; finite element analysis; statistical methods; techniques; mechanism; focus; causes; epicenters; strong motion; accelerograms; faults; prediction  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932242 79-16588

**Linearised and truly nonlinear dynamic response of offshore structure-foundation systems**

Smith, I. M.; Molenkamp, F.  
Advanced study institute and international conference on dynamical methods in soil and rock mechanics, Karlsruhe, Germany, Federal Republic of, Sept. 5-16, 1977  
Publ: A. A. Balkema  
2. 294 320p., 1978  
ISBN 9061910250 28 REFS.  
Subfile: B

Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus: tables  
Descriptors: \*soil mechanics; \*foundations; \*marine installations; theoretical studies; loading; response; mathematical methods; models; finite element analysis; statistical methods; deformation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Numerical solution of problems involving explosive loading**  
Nelson, I.  
Weidlinger Assoc., New York, N.Y., USA  
Advanced study institute and international conference on dynamical methods in soil and rock mechanics, Karlsruhe, Germany, Federal Republic of, Sept. 5-16, 1977  
Publ: A. A. Balkema

2. 239-297p., 1978  
ISBN: 9061910250 24 REFS.  
Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus: tables  
Descriptors: \*soil mechanics; \*rock mechanics; \*foundations; \*automatic data processing; \*explosions; theoretical studies; deformation; methods; mathematical methods; finite element analysis; statistical methods; failure; current research  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932229 79-16487

**Constitutive models for use in numerical computations**  
Nelson, I.  
Weidlinger Assoc., New York, N.Y., USA  
Advanced study institute and international conference on dynamical methods in soil and rock mechanics, Karlsruhe, Germany, Federal Republic of, Sept. 5-16, 1977  
Publ: A. A. Balkema

2. 45-97p., 1978  
ISBN: 9061910250 32 REFS.  
Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus:

Descriptors: \*soil mechanics; \*rock mechanics; methods; mathematical methods; models; mathematical models; finite element analysis; statistical methods; theoretical studies; current research; stress; strain; deformation; loading; testing  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

932241 79-16488

930884 79 16311

**Finite element analyses of arch abutments**

D'Appolonia, E.; Shaw, D. E.; Richard, J.; Raynaud, D. A.  
D'Appolonia Consult. Eng., Pittsburgh, Pa., USA

**Rock engineering for foundations and slopes; proceedings of a specialty conference, Vol. 1**

Anonymous  
Rock engineering for foundations and slopes. Boulder, Colo.: United States, August 15-18, 1976  
Publ.: Am. Soc. Civ. Eng.  
55-81p., 1976

Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English

illus., tables  
Latitude: N443000 Longitude: W0740000; W0750000  
Descriptors: Quebec; rock mechanics; engineering geology; case studies; arch abutments; Canada; Montreal; analysis; finite element analysis; statistical methods; supporting capacity; load cells; grouting; techniques; materials; properties; clays; stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

930806 79-13182

**Infiltration and laboratory permeability studies of spoils from selected coal strip mines, Powder River basin, Wyoming and Montana**

Farkas, F. S.  
South Dakota School of Mines & Technol., Rapid City, S. D., USA

unknownwp., 1976  
Subfile: P  
Degree Level: Master's  
Country of Publ.: United States  
Doc Type: MFSIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Latitude: N430000 Longitude: W1040000; W1080000  
Descriptors: Montana; Wyoming; engineering geology; waste disposal; United States; Powder River basin; coal; organic residues; strip mining; spoils; deposits; infiltration; permeability; experimental studies; hydraulic conductivity; hydraulics; hydrology; properties; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

227526 79 13753

**Seismic soil-structure interaction by finite elements case studies**

Pandya, V.; Setlur, A. V.  
Flour Pioneer, Chicago, Ill., USA  
Second ASCE specialty conference on structural design of nuclear plant facilities, New Orleans, La., United States, December 8-10, 1975  
ASCE Spec. Conf. Struct. Des. Nucl. Plant Facil. 2, R26-R36p., 1976  
8 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: nuclear facilities; foundations; soil mechanics; seismic response; case studies; soil-structure interaction; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

929488 79-13263

**Evaluation of probability of seismic liquefaction**

Ferritto, J. M.  
Am. Soc. Civ. Eng., Proc., J. Tech. Coun. ASCE 103: ICI, 65-73p., 1977  
11 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: geologic hazards; soil mechanics; earthquakes; theoretical studies; seismic risk; liquefaction; ground motion; triaxial tests; site exploration  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

928371 79-12254

**Estimating densities in contoured orientation diagrams**

Ramsden, J. ; Cruden, D. M.  
 Alberta Res. Council, Atmos. Sci. Div., Edmonton, Alberta,  
 CAN, Univ. Alberta, CAN  
 Geol. Soc. Am. Bull. 90 3. 1 229-1 231. 11 580-11 607  
 1979

P. CODEN: BUGCMAF

Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

Print, microfiche, illus., tables

Descriptors: automatic data processing; structural geology  
 ; structural analysis ; methods; preferred orientation ;  
 digital simulation; statistical methods; diagrams;  
 theoretical studies; graphic methods; density; orientation;  
 contour diagrams; mathematical models; models; fabric;  
 rock mechanics

Section Headings: 16 (STRUCTURAL GEOLOGY)

927732 79-09435

**Some physical rock parameters of New York City water tunnel  
 3 and their relation to ground water inflows**

Dvirnyk, M.  
 Brooklyn Coll., Brooklyn, N.Y., USA  
 unknownp., 1976

Subfile: B

Degree Level: Master's

Country of Publ.: United States

Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Languages: English

Latitude: N403000 Longitude: W0734500; W0740500  
 Descriptors: New York; ground water; rock mechanics ;  
 engineering geology; surveys; materials; properties ;  
 tunnels; physical properties; United States; movement;  
 hydraulics; hydrodynamics; joints; fractures; statistical  
 analysis; materials; properties

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

927087 79-09480

**Statisticheskoye modelirovaniye stadiy opolznevoego protsessa  
 Statistical modeling of the stages of creep processes**

Budarenko, A. A.

**Gidrodinamicheskoye i geodinamicheskoye protsessy**

Golubov, A. I. (EDITOR)  
 Vses. Nauchno Issled. Inst. Gidrogeol. Inzh. Geol. Tr. 1  
 N 5. 115. 52 56p. 1977  
 ISSN 0541-1925 5 REFS  
 Subfile: B

Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: Russian

Descriptors: soil mechanics ; materials; properties ;

creep; mathematical models; models; statistical methods;

materials, properties

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

926683 79-09569

**Statistical activities during 1976 and the design and  
 initial analysis of nuclear site studies**

Gilbert, R. O.; Essington, E. H.; Brady, D. N.; Doctor, P.  
 G.; Eberhardt, L. L. Lab., Richland, Wash., USA; Los Alamos  
 Pacific Northwest Lab., Richland, Wash., USA; Los Alamos  
 Sci. Lab, USA

**Transuranics in desert ecosystems; Nevada Applied Ecology  
 Group**

White, M. G. (EDITOR); Dunaway, P. B. (EDITOR); Wieman, D.  
 I. (EDITOR)

331-366p., 1977

23 REFS

Subfile: B

Doc Type: REPORT Bibliographic Level: ANALYTIC

Languages: English

Report No.: NVO-181; UC-11

Availability: NTIS, Springfield, Va., United States

Illus., tables

Descriptors: Nevada; americium; cesium; plutonium;  
 cobalt ; engineering geology; geochemistry ; nuclear  
 facilities; soils; statistical analysis; site exploration;  
 United States; pollution; radionuclides; pollutants

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

926631 79-09573

**The use of GRASP, a finite element program, to model faulted gas reservoirs of the southern North Sea basin**  
Goldwater, M. H.; Collins, P. A.; Taylor, B. A.

**2 European offshore petroleum conference & exhibition; Volume 2**

Anonymous  
Proceedings of the European offshore petroleum conference & exhibition, London, United Kingdom, Oct. 24-27, 1978  
Publ. Soc. Petroleum Eng.  
219-232p., 1978  
14 REFS.

Subfile: B  
Country of Publ.: United Kingdom  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.: sketch maps  
Descriptors: \*North Sea; \*engineering geology; \*automatic data processing; \*petroleum engineering; GRASP; finite element analysis; statistical methods; natural gas; faults; subsurface reservoirs; mathematical models; models; Atlantic Ocean; two-dimensional models; identifiable field; Leman Field; Viking Field  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

926453 79-09877

**Interpretation of flat jack tests and field measurements in tunnels by means of finite element analyses**  
Witte, W.

**Field measurements in rock mechanics; Volume 2**  
Kovari, K. (EDITOR)  
Field measurements in rock mechanics, Zurich, Switzerland, April 4-6, 1977  
Publ. A. A. Balkema  
997-1018p., 1977  
11 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.: sketch map  
Latitude: N500600; Longitude: E0081000; E0080500  
Descriptors: \*rock mechanics; \*soil mechanics; \*West Germany; techniques; engineering geology; flat jack tests; tunnels; interpretation; finite element analysis; statistical methods; deformation; field studies; Germany; Europe; Wiesbaden; Ernstbach; dams; reservoirs; surface reservoirs; site exploration; Stuttgart; Hesse  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

926451 79-09485

**Rockmeter deformations at the Emosson arch dam; comparison between computation and measurements**

Bossonney, C.  
Motor-Columbus Consult. Eng., Baden, CHE

**Field measurements in rock mechanics; Volume 2**

Kovari, K. (EDITOR)  
Field measurements in rock mechanics, Zurich, Switzerland, April 4-6, 1977  
Publ. A. A. Balkema  
969-984p., 1977  
8 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: \*Switzerland; \*France; \*rock mechanics; engineering geology; deformation; dams; Europe; Emosson Dam; arch dams; elasticity; plasticity; finite element analysis; statistical methods; abutments; foundations; field studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

926447 79-09511

Consideration of natural stresses in the rock massif and the technology of construction with respect to the calculation of underground opening by means of the finite element method  
Christov, T.; Iliev, S.

Field measurements in rock mechanics; Volume 2

Kovari, K.(EDITOR)  
Field measurements in rock mechanics. Zurich, Switzerland, April 4-6, 1977  
Publ: A. A. Balkema  
905-918p.. 1977  
2 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English

Descriptors: automatic data processing; rock mechanics; engineering geology; deformation; stress; finite element analysis; statistical methods; construction; strain; underground installations; field studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

926446 79-09507

Interpretation of in situ deformation behavior of a rectangular test shaft using finite element method  
Chan, S. S. M.; Beus, M. J.

Field measurements in rock mechanics

Kovari, K.(EDITOR)  
Field measurements in rock mechanics. Zurich, Switzerland, April 4-6, 1977  
Publ: A. A. Balkema  
889-903p.. 1977  
11 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English

illus., tables, sketch map  
Latitude: N472500; N473000 Longitude: W1155000; W1160000  
Descriptors: Idaho; rock mechanics; engineering geology; field studies; deformation; Kootenai County; United States; Coeur d'Alene; silver; ore deposits; quartzite; metamorphic rocks; stress; strength; finite element analysis; statistical methods; Caladay; Wallace  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

926445 79-09530

A contribution to the common application of field measurements and the finite element method  
Dolazalova, M.

Field measurements in rock mechanics

Kovari, K.(EDITOR)  
Field measurements in rock mechanics. Zurich, Switzerland, April 4-6, 1977  
Publ: A. A. Balkema  
873-888p.. 1977  
18 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English

Descriptors: underground installations; construction; design; finite element analysis; statistical methods; field studies; methods; techniques  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

926444 79-09797

Interpretation of field measurements in undersea tunnels with the aid of mathematical models  
Sakurai, S.

Field measurements in rock mechanics

Kovari, K.(EDITOR)  
Field measurements in rock mechanics. Zurich, Switzerland, April 4-6, 1977  
Publ: A. A. Balkema  
859-871p.. 1977  
3 REFS.

Subfile: B  
Country of Publ.: Netherlands  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English

illus., chart  
Latitude: N412000; N414000 Longitude: E1413000; E1400000  
Descriptors: Japan; engineering geology; marine installations; mathematical models; measurements; submarine installations; interpretation; Asia; Seikan Tunnel; Honshu; Hokkaido; field studies; structures; deformation; strain; shear strength; stress; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 926412 79-09607  
**Rock deformability measured in situ; problems and solutions**  
 Heuze, F. E.; Salem, A.  
 Univ. Colo. Dep. Civ. Eng. Boulder, Colo. USA
- Field measurements in rock mechanics; Volume 1**  
 Kovari, K. (EDITOR)  
 Field measurements in rock mechanics. Zurich, Switzerland, April 4-6, 1977  
 Publ. A. A. Balkema  
 375-387p., 1977  
 22 REFS.  
 Subfile B  
 Country of Publ.: Netherlands  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: rock mechanics; deformation; measurement; in situ; boreholes; finite element analysis; statistical methods; plate-bearing tests; flat jack tests; dilatometer tests; loading; techniques; field studies  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 926411 79-09482  
**Flat jack test and determination of mechanical characteristics**  
 Bonvallet, J.; Dejean, M.  
**Field measurements in rock mechanics; Volume 1**  
 Kovari, K. (EDITOR)  
 Field measurements in rock mechanics. Zurich, Switzerland, April 4-6, 1977  
 Publ. A. A. Balkema  
 361-374p., 1977  
 2 REFS.  
 Subfile B  
 Country of Publ.: Netherlands  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: rock mechanics; techniques; flat jack tests; mines; quarries; elasticity; creep; stress; strain; mathematical models; models; field studies; theoretical studies; finite element analysis; statistical methods; three-dimensional models; deformation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 924420 79-03387  
**Mechanical properties of cores obtained from the unleached**
- saline zone, Piceance Creek basin, Rio Blanco County, Colo.**  
 Horton, F. G.; Hooker, V. E.  
 Bur. Mines, Denver Mining Res. Cent., Denver, Colo. USA  
 U. S. Bur. Mines, Rep. Invest. 8297, 21p., 1978  
 COPRN XBMIA6 14 REFS.  
 Subfile B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 illus., tables, plates, sketch maps  
 Latitude N39200; W1081500 Longitude W1081500; W1085000  
 Descriptors: Colorado; rock mechanics; engineering geology; materials; properties; physical properties; Rio Blanco County; Garfield County; Mesaverde Group; Ohio Creek Conglomerate; Fort Union Formation; Wasatch Formation; Green River Formation; Uinta Formation; United States; Piceance Creek basin; mechanical properties; experimental studies; tunnels; young's modulus; elastic constants; Poisson's ratio; controls; materials; properties; Cretaceous; Mesozoic; Tertiary; Cenozoic; stratigraphy; geomorphology; well-logging; cores; triaxial tests; Brazil tests; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 922909 79-06197  
**Rock weathering on the molecular level**  
 Hader, P.  
 Univ. Windsor, Dep. Geol., Windsor, Ont., CAN  
**Decay and preservation of stone**  
 Winkler, F. M. (EDITOR)  
 Symposia on decay and preservation of stone. The Geological Society of America, annual meetings, 1977  
 Eng. Geol. Case Hist. 11, 47-51p., 1978  
 CODEN EGCHAH 24 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 tables  
 Descriptors: weathering; rock mechanics; analysis; failure; statistical analysis; engineering geology; building stone; construction materials; experimental studies; frost action; chemical weathering; physical weathering; porosity; data  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

922904 79-06178

**Absorption and other properties of carbonate rock affecting soundness of aggregate**

Harvey, R. D.; Baxter, J. W.; Fraser, G. S.; Smith, C. B.  
Ill. State Geol. Surv., Urbana, Ill., USA

**Decay and preservation of stone**

Winkler, E. M. (EDITOR)  
Symposia on decay and preservation of stone; The Geological Society of America, annual meetings, 1977  
Eng. Geol. Case Hist. 11, 7-16p., 1978  
CODEN: ECGV4H 18 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Tables, Sketch map  
Latitude: N370000, N423000 Longitude: W0873000; W0913000  
Descriptors: Illinois; construction materials; rock mechanics; aggregate; United States; carbonate rocks; highways; absorption; statistical analysis; regression analysis; standard tests; ASTM standards; materials; properties; data  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

922773 79-05965

**Design analysis of annular tunnels for super conductive energy storage using the finite element method**

Fuh, G. F.  
Univ. of Wisconsin, Madison, Wis., USA  
246p., 1978  
Subfile: B

Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Availability: Univ. Microfilms  
Descriptors: tunnels; rock mechanics; design; failure; finite element analysis; statistical methods; stress; loading; magnets; storage; stabilization; rockbolting; theoretical studies; field studies; granite; granite-granodiorite family  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

922683 79-06134

**Prediction of shoreline erosion trends from synoptic beach surveys, Rhode Island coast**

Fisher, J. J.; Gaultie, S. G.  
Univ. R.I., Dep. Geol., Kingston, R.I., USA; Shell Explor., USA

The Geological Association of Canada, The Mineralogical Association of Canada, The Geological Society of America (91st annual meeting); 1978 joint annual meeting. Toronto, Ont., Canada, Oct. 23-26, 1978

Geol. Soc. Am., Abstr. Programs 10: 7, 401-402p., 1978  
CODEN: GAAPBC  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Latitude: N419000; N414500 Longitude: W0710700; W0715000  
Descriptors: Rhode Island; automatic data processing; engineering geology; shorelines; discriminant analysis; United States; beaches; erosion; prediction; statistical analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

922316 79-06190

**A quantitative model of dilatancy in dry rock and its application to Westerly Granite**

Holcomb, D. J.  
Univ. Colo./NDA, Coop. Inst. Res. Environ. Sci. Boulder, Colo., USA

J. Geophys. Res. 83: B10, 4941-4950p., 1978  
CODEN: JGREA2 16 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

Descriptors: rock mechanics; deformation; theoretical studies; strain; Westerly Granite; dilatancy; cracks; microcracks; stress; statistical analysis; mathematical models; dry rocks; brittle materials; loading; granite; granite-granodiorite family; earthquakes; prediction; precursors; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

921325 79-06135  
**Axisymmetric compression of a Mohr-Coulomb medium around a circular hole**  
 Florence, A. L.; Scher, L. E.  
 SRI Int., Poulter Lab., Menlo Park, Calif., USA  
 Int. J. Numer. Anal. Methods Geomech. 2, 4, 367-379p., 1978  
 ISSN 0363-9061 5 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*rock mechanics; loading; compression; Mohr envelope; Coulomb's law; finite element analysis; statistical methods; plastic materials; elastic materials; numerical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

921324 79-06323  
**Slipping strip analysis of reinforced earth**  
 Taylor, D. J.; Richards, H.  
 Int. J. Numer. Anal. Methods Geomech. 2, 4, 343-366p., 1978  
 ISSN 0363-9061 18 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, sects.  
 Descriptors: \*soil mechanics; materials; properties; reinforced earth; materials, properties; plane strain; homogeneous materials; elastic materials; algorithms; Mohr envelope; Coulomb's law; shear modulus; elastic constants; finite element analysis; statistical methods; slip; mathematical models; models; displacements; Young's modulus; cohesive materials; stress; Poisson's ratio  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

921319 79-06099  
**Numerical approximations in pile-driving analysis**  
 Davis, R. D.; Pheasant, P. J.  
 Int. J. Numer. Anal. Methods Geomech. 2, 3, 303-310p., 1978  
 ISSN 0363-9061 9 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*soil mechanics; loading; plasticity;

materials, properties; finite element analysis; statistical methods; response; failure; prediction; bearing capacity  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)  
 921315 79-06102  
**Finite element simulation of freezing processes in soils**  
 Del Giudice, S.; Comini, G.; Lewis, R. W.  
 Int. J. Numer. Anal. Methods Geomech. 2, 3, 223-235p., 1978  
 ISSN 0363-9061 16 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., sects.  
 Descriptors: \*soil mechanics; frost action; simulation; finite element analysis; statistical methods; stabilization; numerical analysis; mathematical models; models; two dimensional models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

921250 79-06039  
**The sensitivity of low probability seismic risk estimation to seismicity model parameters in eastern Canada**  
 Berry, M. J.; Weichert, D. H.; Basham, P. W.  
 Earth Phys. Branch, Ottawa, Ont., CAN  
 Canadian Geophysical Union: 5th annual meeting. London, Ont., Canada. May 15-17, 1978  
 Eos (Am. Geophys. Union, Trans.) 59, 12, 1033p., 1978  
 CODEN: EOSTAU  
 Subfile B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Latitude: N430000 Longitude: W0850000  
 Descriptors: \*Canada; \*Quebec; \*Ontario; \*Maritime Provinces; engineering geology; nuclear facilities; geologic hazards; seismic risk; seismology; seismicity; site exploration; seismotectonics; models; tectonics; earthquakes; ground motion  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

921119 79-06124

**Geotechnical performance of a tunnel in till**

Eisenstein, Z.; Inomson, S.  
Univ. Alta. Dep. Civil Eng., Edmonton, Alta., CAN  
Can. J.otech. J., 15, 3, 332-345p., 1978  
CODEN: CQJDAH 13 REFS.  
Subfile: B  
Country of Publ.: Canada  
Doc Type SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.: table  
Latitude: N533000 Longitude: W1133000; W1133000  
Descriptors: Alberta; engineering geology; tunnels;  
Canada; Edmonton; site exploration; materials; properties;  
till; clastic sediments; finite element analysis;  
statistical methods; settlement; stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919828 79-02285

**Static and seismic landslide susceptibility**

Waczonek, G. F.  
Univ. Calif., Dep. Civ. Eng., Berkeley, Calif., USA  
The Geological Society of America, Cordilleran Section, 74th  
annual meeting, Tempe, Ariz., United States, March 29-31,  
1978  
Geol. Soc. Am., Abstr. Programs 10: 3, 153p., 1978  
CODEN: GAAPBC  
Subfile: B  
Country of Publ.: United States  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
Latitude: N371500; N373000 Longitude: W1221500; W1224000  
Descriptors: California; Pacific Coast; geomorphology;  
engineering geology; mass movements; slope stability;  
geologic hazards; landslides; Santa Mateo County; United  
States; Santa Cruz Mountains; Central California; La Honda;  
San Francisco region; statistical analysis; seismicity;  
earthquakes; susceptibility; debris flows; rock falls  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919728 79-02166

**Dureza de Schmidt vs propiedades mecanicas en muestras de  
roca; correlacion estadistica  
Schmidt hardness versus mechanical properties in rock  
samples; statistical correlation**

Munoz, R. H.  
Minerales 33: 142, 37-44p., 1978  
CODEN: MINCAN 5 REFS.  
Subfile: B  
Country of Publ.: Chile

Doc Type SERIAL Bibliographic Level: ANALYTIC  
Languages: Spanish Summary Languages: English  
illus.: tables

Descriptors: rock mechanics; materials; properties;  
Schmidt hardness; compressive strength; Young's modulus;  
elastic constants; Poisson's modulus; angle of internal  
friction; shear strength; statistical methods; experimental  
studies; materials; properties; methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919639 79-01993

**Construction of the underground car park at the Palace of  
Westminster, Londondiscussion**

Rurland, J. B.

**Deep foundations and deep excavations**

Anonymous  
Sixth European conference on soil mechanics and foundation  
engineering; Deep foundations and deep excavations, Vienna,  
Austria, March 22-24, 1976  
Eur. Conf. Soil Mech. Found. Eng., Proc. 6, Vol. 2.2,  
47-49p., 1976  
CODEN: ESMFA9 5 REFS.

Subfile: B

Country of Publ.: International

Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English

Descriptors: England; engineering geology; foundations;  
Great Britain; Europe; London; construction; excavations;  
slope stability; diaphragm walls; soil mechanics;  
stabilization; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919564 79-02014

**Underground opening and deep excavation in jointed rock**  
Dolezalova, M

**Deep foundations and deep excavations**

Anonymous  
Sixth European conference on soil mechanics and foundation engineering; Deep foundations and deep excavations. Vienna, Austria, March 22-24, 1976  
Eur. Conf. Soil Mech. Found. Eng., Proc. 6, Vol. 1, 297-304p., 1976  
CODEN ESMFA9 7 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English Summary Languages: French  
illus.

Descriptors: rock mechanics; fractures; excavations; distribution; stress; finite element analysis; joints; statistical methods; deformation; failure  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919516 79-01972

**Stability of slopes in variational and probabilistic solutions**  
Biernatowski, K.

**Deep foundations and deep excavations**

Anonymous  
Sixth European conference on soil mechanics and foundation engineering; Deep foundations and deep excavations. Vienna, Austria, March 22-24, 1976  
Eur. Conf. Soil Mech. Found. Eng., Proc. 6, Vol. 1, 37 p., 1976  
CODEN ESMFA9 10 REFS

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English Summary Languages: German  
illus; table

Descriptors: slope stability; theoretical studies; stress; shear stress; statistical methods; probabilistic methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919119 79-01958

**Boundary element methods in geomechanics**  
Bauerjona, P. K.; Butterfield, R.

**Finite elements in geomechanics**

Gudehus, G (EDITOR)  
Finite elements in geomechanics. Karlsruhe, Germany, Federal Republic of, Sept., 1975  
Publ. John Wiley & Sons  
529-570p., 1977  
61 REFS.

Subfile: B  
Country of Publ.: United Kingdom  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
illus.

Descriptors: rock mechanics; soil mechanics; methods; finite element analysis; boundary; flow; mathematical models; transient processes; statistical methods; elastoplasticity  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919118 79-02043

**Accuracy in data input and in stress calculations**  
Gallagher, R. H.

**Finite elements in geomechanics**

Gudehus, G (EDITOR)  
Finite elements in geomechanics. Karlsruhe, Germany, Federal Republic of, Sept., 1975  
Publ. John Wiley & Sons  
513-528p., 1977  
37 REFS.

Subfile: B  
Country of Publ.: United Kingdom  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
illus.

Descriptors: rock mechanics; soil mechanics; methods; finite element analysis; statistical methods; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919117 79-02135

**Interaction between water flow phenomena and the mechanical behaviour of soil or rock masses**

Louis, C.; Dasseigne, J. L.; Feuga, B.

**Finite elements in geomechanics**

Gudehus, G. (EDITOR)

Finite elements in geomechanics, Karlsruhe, Germany, Federal Republic of, Sept., 1975

Publ: John Wiley & Sons

479-51pp., 1977

37 REFS.

Subfile: B

Country of Publ.: United Kingdom

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*soil mechanics; \*rock mechanics; methods; finite element analysis; flow regime; ground water; pore water; fractures; joints; aquifers; dams; porous media; movement; hydraulic conductivity; mathematical models; statistical methods; underground installations

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919116 79-02289

**New design concept for underground openings in rock**

Witte, W.

**Finite elements in geomechanics**

Gudehus, G. (EDITOR)

Finite elements in geomechanics, Karlsruhe, Germany, Federal Republic of, Sept., 1975

Publ: John Wiley & Sons

413-47pp., 1977

20 REFS.

Subfile: B

Country of Publ.: United Kingdom

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*underground installations; \*tunnels; \*West Germany; design; engineering geology; construction; rock mechanics; stability; fractures; joints; stress; strain; mathematical models; case studies; finite element analysis; statistical methods; three-dimensional models

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919115 79-02119

**The elasto-plastic analysis in the design practice of underground openings**

Kovari, K.

**Finite elements in geomechanics**

Gudehus, G. (EDITOR)

Finite elements in geomechanics, Karlsruhe, Germany, Federal Republic of, Sept., 1975

Publ: John Wiley & Sons

377-412pp., 1977

36 REFS.

Subfile: B

Country of Publ.: United Kingdom

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*underground installations; \*tunnels; \*rock mechanics; \*soil mechanics; theoretical studies; mathematical models; elastoplasticity; methods; design; models; loading; finite element analysis; statistical methods; strain; strength; stability

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919114 79-02055

**Analysis in jointed rocks**

Goodman, R. E.

**Finite elements in geomechanics**

Gudehus, G. (EDITOR)

Finite elements in geomechanics, Karlsruhe, Germany, Federal Republic of, Sept., 1975

Publ: John Wiley & Sons

351-375pp., 1977

20 REFS.

Subfile: B

Country of Publ.: United Kingdom

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*rock mechanics; deformation; fractures; joints; materials; properties; stress; shear stress; mathematical models; models; shear strength; dilatancy; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 919113 79-02287  
**Finite elements for foundations, joints and fluids**  
 Wilson, F. L.  
**Finite elements in geomechanics**  
 Gudebus, G. (EDITOR)  
 Finite elements in geomechanics. Karlsruhe, Germany.  
 Federal Republic of, Sept., 1975  
 Publ: John Wiley & Sons  
 319-350p., 1977  
 16 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*reservoirs; \*foundations; \*soil mechanics;  
 \*rock mechanics; \*dams; methods; finite element analysis;  
 mathematical models; models; statistical methods;  
 deformation; three-dimensional models; earthquakes;  
 two dimensional models; surface reservoirs  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 919112 79-02269  
**Generation and dissipation of pore-water pressures**  
 Verruljt, A.  
**Finite elements in geomechanics**  
 Gudebus, G. (EDITOR)  
 Finite elements in geomechanics. Karlsruhe, Germany.  
 Federal Republic of, Sept., 1975  
 Publ: John Wiley & Sons  
 297-317p., 1977  
 14 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*soil mechanics; \*automatic data processing;  
 methods; engineering geology; finite element analysis;  
 pore pressure; pore water; mathematical models;  
 sand; clastic sediments; clays; consolidation; statistical  
 methods; deformation; porous media; dilatancy; strain;  
 plane strain; computer programs  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 919111 79-02724  
**Some time-dependent soil-structure interaction problems**
- Smith, J. M.  
**Finite elements in geomechanics**  
 Gudebus, G. (EDITOR)  
 Finite elements in geomechanics. Karlsruhe, Germany.  
 Federal Republic of, Sept., 1975  
 Publ: John Wiley & Sons  
 251-291p., 1977  
 28 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.; table  
 Descriptors: \*soil mechanics; \*foundations; methods;  
 finite element analysis; pore water; pore pressure; models;  
 mathematical models; statistical methods; loading;  
 structures  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 919110 79-02006  
**Soil-structure interaction and simulation problems**  
 Desai, C. S.  
**Finite elements in geomechanics**  
 Gudebus, G. (EDITOR)  
 Finite elements in geomechanics. Karlsruhe, Germany.  
 Federal Republic of, Sept., 1975  
 Publ: John Wiley & Sons  
 209-250p., 1977  
 69 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*soil mechanics; \*foundations; methods;  
 mathematical models; structures; models; finite element  
 analysis; statistical methods; loading; settlement; piles;  
 clays; stress; tensile stress; adhesion; cohesion; shear  
 stress; strain; three-dimensional models; ground water;  
 levels; excavations  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919109 79-02290  
**The predicted performance of soft clay under a trial embankment loading based on the Cam-clay model**  
 Wroth, C. P.

**Finite elements in geomechanics**  
 Gudehus, G. (EDITOR)  
 Finite elements in geomechanics. Karlsruhe, Germany. Federal Republic of, Sept., 1975  
 Publ: John Wiley & Sons  
 191-208p., 1977  
 8 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table  
 Latitude: N422500; M423000 Longitude: W0705500; W0711000  
 Descriptors: \*soil mechanics; \*Massachusetts; materials; properties; engineering geology; clays; highways; Essex County; models; strain; plane strain; Cam-clay models; soft clay; materials; properties; embankments; settlement; mathematical models; loading; prediction; United States; finite element analysis; statistical methods; Sangus  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919108 79-02293  
**Some useful forms of isotropic yield surfaces for soil and rock mechanics**  
 Zienkiewicz, O. C.; Pande, G. N.

**Finite elements in geomechanics**  
 Gudehus, G. (EDITOR)  
 Finite elements in geomechanics. Karlsruhe, Germany. Federal Republic of, Sept., 1975  
 Publ: John Wiley & Sons  
 179-190p., 1977  
 9 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*soil mechanics; \*rock mechanics; methods; finite element analysis; isotropy; plasticity; stress; strain; models; mathematical models; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**A unified approach to soil mechanics problems (including plasticity and visco-plasticity)**  
 Zienkiewicz, O. C.; Humpheson, C.; Lewis, R. W.

**Finite elements in geomechanics**  
 Gudehus, G. (EDITOR)  
 Finite elements in geomechanics. Karlsruhe, Germany. Federal Republic of, Sept., 1975  
 Publ: John Wiley & Sons  
 151-177p., 1977  
 31 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*soil mechanics; \*rock mechanics; methods; finite element analysis; loading; foundations; deformation; strain; stress; elasticity; plasticity; viscoplasticity; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919104 79-02063  
**Some interactions of finite element methods and geomechanics: a survey**  
 Gudehus, G.

**Finite elements in geomechanics**  
 Gudehus, G. (EDITOR)  
 Finite elements in geomechanics. Karlsruhe, Germany. Federal Republic of, Sept., 1975  
 Publ: John Wiley & Sons  
 1-31p., 1977  
 15 REFS.  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table  
 Descriptors: \*rock mechanics; \*soil mechanics; methods; finite element analysis; statistical methods; mathematical models; processes; elasticity; plasticity  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

919103 79-01895  
**Finite elements in geomechanics**  
 Gudehus, G (EDITOR)  
 Finite elements in Geomechanics, Karlsruhe, Germany,  
 Federal Republic of, Sept., 1975  
 Publ. John Wiley & Sons  
 573p., 1977  
 Subfile: B  
 Country of Publ.: United Kingdom  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
 Level: MONOGRAPHIC  
 Languages: English  
 Note: Individual papers are cited herein under the separate  
 authors; a Wiley Interscience Publication. illus.  
 Descriptors: rock mechanics.; symposia.; soil mechanics.;  
 methods.; engineering geology.; finite element analysis;  
 statistical methods.; mathematical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

915351 78-44146  
**On the deformation properties of dry crust clay as a  
 function of water content and degree of compression**  
 Sverdlov, V  
**Engineering geological properties of clays and processes in  
 them; Moscow International symposium**  
 Abstracts  
 Engineering geological properties of clays and processes in  
 them; Moscow International Symposium, Moscow, Union of  
 Soviet Socialist Republics, Sept. 15-23, 1971  
 Int. Assoc. Eng. Geol., Bull., 5, 85-90p., 1972  
 COPEN BIFGR 4 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus.; table, sketch map  
 Latitude: N594500; N700000 Longitude: E0114500; E0190000  
 Descriptors: Finland.; soil mechanics.; engineering  
 geology; materials; properties; clays; Europe; moisture  
 content; compression; deformation; materials; properties;  
 statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

917978 79-01903  
**A multivariable-statistical approach to the evaluation of  
 the undrained behaviour of clays**  
 Maddari, P  
 Univ. of Toronto, Toronto, Ont., CAN  
 unknownp., 1977  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: Canada  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms  
 Latitude: N420000; N570000 Longitude: W0740000; W0950000  
 Descriptors: soil mechanics.; materials; properties;  
 clays; materials; properties; statistical analysis;  
 multivariate analysis; deformation; loading; undrained  
 materials; Ontario; Canada; models; mathematical models;  
 shear strength; theoretical studies  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

915407 78-43605  
**Multivariate analysis techniques with application in mining**  
 McWilliams, P. C.; Tesarik, D. R.  
 U. S. Bur. Mines, Spokane Min. Res. Cent., Spokane, Wash.  
 USA  
 U. S. Bur. Mines, Inf. Circ. 8782, 40p., 1978  
 CODEN: XIMIAL 18 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 illus.; tables

914182 78-44105

**Design response spectra for moderate magnitude local earthquakes at rock and stiff-soil sites**  
 Sadigh, K.; Houps, L.; Idriss, I. M.  
 Woodward-Clyde Consult., San Francisco, Calif., USA  
 The Geological Society of America, Cordilleran Section, 73rd annual meeting, Sacramento, Calif., United States, April 5-7, 1977

Geol. Soc. Am., Abstr. Programs 9: 4, 493p., 1977

CODEN: GAAPBC

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

Descriptors: earthquakes; seismology; geologic hazards; nuclear facilities; effects; design; ground motion; strong motion; seismic risk; magnitude; rock mechanics; soil mechanics; spectral analysis; elastic waves; statistical analysis; site exploration

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

914053 78-43872

**Metod vybora vida zakona raspredeleniya pri statisticheskoj obrabotke fiziko-mekhanicheskikh svoystv gornykh porod**  
 A method of selecting the distribution law mode during statistical analysis of physical-mechanical properties of rocks

Glushko, V. T.; Bohro, N. T.; Rubets, G. T.; Khizhnyak, N.

Razrab. Rudn. Mestorozhd. 16: Podzemnyye gornyye raboty.

36-43p., 1973

ISSN: 0486-0705

Subfile: B

Country of Publ.: Union of Soviet Socialist Republics

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Language: Russian

Descriptors: engineering geology; materials; properties; statistical methods; materials, properties

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

913998 78-43548

**Earth Resources Program: Development of a computer-aided procedure for the national program of inspection of dams**

Anonymous

variously paginated., 1973

Subfile: B

Doc Type: REPORT Bibliographic Level: MONOGRAPHIC

Language: English

Report No.: JSC-08449

Availability: NASA, L.B.J. Space Cent., Houston, Tex.,

United States

illustrations, tables, sketch maps  
 Descriptors: remote sensing; engineering geology; dams; automated data processing; applications; methods; site exploration; ERIS; multispectral analysis; discriminant analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

913957 78-43888

**Diminution ratios for planning construction-area sediment controls**

Guy, H. P.

U. S. Geol. Surv., Reston, Va., USA

**National symposium on urban hydrology, hydraulics, and sediment control; proceedings**

Barfield, B. J. (EDITOR); De Vore, R. W. (EDITOR)

National symposium on urban hydrology, hydraulics, and sediment control, Lexington, Kent., United States, July 27-29, 1976

Publ. Univ. Kent., Coll. Engineer., Off. Res. and Engineer. Serv.

91-97p., 1976

14 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

illustrations, sketch map

Latitude: N250000; N490000 Longitude: W0670000; W0980000

Descriptors: Eastern U.S.; sedimentation; soils; engineering geology; controls; erosion; site exploration; hydrogeology; planning; statistical methods; United States

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

917397 78 43696

**Earthquakes, faults and nuclear power plants in southeastern New York - northern New Jersey**  
Aronow, Y. P.; Sykes, L. R.  
Lamont-Doherty Geol. Obs., Palisades, N.Y., USA  
American Geophysical Union, 1978 Spring annual meeting,  
Miami Beach, Fla., United States, April 17-21, 1978  
Eos (Am. Geophys. Union, Trans.) 59: 4, 317p., 1978  
CIPFN FOSTAJ

Subfile B  
Country of Publ.: United States  
Doc. Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Latitude: N400000 Longitude: W0733000; W0750000  
Descriptors: \*New York; \*New Jersey; \*Atlantic Coastal Plain  
; \*faults; \*seismology ; engineering geology; earthquakes;  
displacements ; geologic hazards; reverse faults;  
probability; United States; New York City region; nuclear  
facilities; epicenters; Ramapo fault; occurrence; North  
America; 1974-1977  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

911929 78 44117

**A case study of the surface subsidence of the Polesine area**  
Schreffler, P. A.; Lewis, R. W.; Norris, V. A.  
Int. J. Numer. Anal. Methods Geomech. 1: 4, 377-386p.,  
1977  
ISSN 0363-9061 12 REFS.  
Subfile B  
Country of Publ.: International

Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Title: table, sketch map  
Latitude: N460000 Longitude: E1130000; E1000000  
Descriptors: \*Italy; \*soil mechanics ; engineering geology;  
failure ; land subsidence, pumping; Europe; Polesine;  
reservoir rocks; pump tests; ground water, natural gas,  
settlement; wells; mathematical models; models; finite  
element analysis; statistical methods; Bosnia  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

911927 78-44217

**Large strain analysis of some geomechanics problems by the finite element method**  
Ramada, F.; Wirth, A. S.  
Int. J. Numer. Anal. Methods Geomech. 1: 3, 299-310p.,  
1977  
ISSN 0363-9061 32 REFS.  
Subfile B  
Country of Publ.: International

Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Title:

Descriptors: \*foundations; \*soil mechanics ; stability ;  
finite element analysis; statistical methods; layered  
materials; homogeneous materials; mathematical models;  
models; finite strain; stress; strain; elastoplastic  
materials; loading  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

911925 78-43932

**Analysis of ground surface settlement due to shallow shield tunnels**

Kawamoto, T.; Okuzono, K.  
Dokumura-gumi Co., Osaka, JPN  
Int. J. Numer. Anal. Methods Geomech. 1: 3, 271-281p.,  
1977  
ISSN 0363-9061 2 REFS.  
Subfile B  
Country of Publ.: International

Doc. Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Title: tables, sects  
Latitude: N344500 Longitude: E1370000; E1363000  
Descriptors: \*Japan ; engineering geology ; tunnels; land  
subsidence; Asia; Honshu; Nagoya; subways; alluvium;  
controls; construction; deformation; settlement; granular  
materials; finite element analysis; statistical methods;  
numerical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

911886 78-43811

**Comparison of lithologic and structural controls on fracturing in carbonate rocks**

Das Gupta, U  
Univ Toronto, Dep Geol, Toronto, Ont, CAN  
The Geological Association of Canada, The Mineralogical Association of Canada, The Geological Society of America (51st annual meeting), 1978 Joint annual meeting.  
Geol Soc Am, Abstr. Programs 10: 7, 385p., 1978  
CODEN TMAPBC  
Subfile B

Country of Publ: United States  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
Languages: English  
Descriptors: Alberta; rock mechanics; Rocky Mountains; fractures; structural analysis; sedimentary rocks; engineering geology; structural geology; deformation; style; carbonate rocks; open fractures; properties; controls; structural controls; lithologic controls; reservoir properties; reservoir rocks; permeability; Turner Valley formation; Canada; North America; Northern Rocky Mountains; Moose Mountain Dome; diagenesis; multivariate analysis; statistical analysis  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

909049 78-39227

**Dynamic models of rock blasting**

Santich, J. R.  
Univ of New South Wales, AUS  
unknown, 1977  
Subfile B  
Degree Level Doctoral  
Country of Publ: Australia  
Doc Type THESES Bibliographic Level MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: explosions; rock mechanics; theoretical studies; fractures; thermodynamics; spalling; elastic waves; propagation; experimental studies; models; mathematical models; finite element analysis; statistical methods  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

909048 78-39233

**Acoustic identification of marine sediments by stochastic methods**

Tugal, H.  
Univ. of New Hampshire, Durham, N.H., USA  
1977  
Subfile B

Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESES Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: soil mechanics; geophysical methods; materials; properties; acoustical methods; sediments; applications; materials; properties; engineering properties; marine environment; statistical methods; stochastic processes; automatic data processing  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

909047 78-39221

**Grouping of marine sediments using a multivariate analysis of seismic profiles**

Milligan, S. D.  
Univ. of Rhode Island, Kingston, R.I., USA  
71p., 1977  
Subfile B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESES Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Latitude: N412000; W415700 Longitude: W0710500; W0712500  
Descriptors: Rhode Island; soil mechanics; sediments; geophysical methods; engineering geology; materials; properties; elastic sediments; seismic methods; distributions; applications; United States; Narragansett Bay; materials; properties; profiles; marine environment; statistical analysis; cluster analysis; statistical methods; reflection methods; classification; sand; silt; clay; engineering properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

908042 78-39219  
Finite element analyses of deep excavation behavior in soft clay  
Maha, A. I.  
Stanford Univ., Stanford, Calif., USA  
35pp., 1978  
Subfile B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: \*automatic data processing; \*soil mechanics; \*underground installations; engineering geology; excavations; materials; properties; clays; finite element analysis; statistical methods; deep excavations; depth; models; mathematical models; materials; properties; simulation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

908076 78-39401  
Probabilistic analysis of the plane shear failure mode  
Marek, J. M.; Savelly, J. P.  
Petrock, Allen and Holt, Tucson, Ariz., USA  
19th U. S. Symposium on rock mechanics, State line, Nev., United States, May 1-3, 1978  
Symp. Rock Mech., Proc., 19, Vol. 2, 40-44p., 1978  
CODEN: PSRMA6 5 REFS.  
Subfile B  
Country of Publ.: Varies  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*rock mechanics; \*slope stability; failure; shear strength; probability; Monte Carlo analysis; mathematical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

908604 78-38263  
Simple graphical methods for estimating the confidence region about the orientation of the intersection of two planes  
Cruden, D.; Keiker, D.  
Univ. Alberta, Dep. Geol., Edmonton, Alberta, CAN  
Can. J. Earth Sci., 15, 10, 1598-1604p., 1978  
CODEN: CJESAP 13 REFS.  
Subfile B  
Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus., table  
Descriptors: \*mathematical geology; \*rock mechanics; \*structural geology; \*automatic data processing; methods; techniques; general; statistical methods; graphics; graphic display; planes; orientation; folds; faults; plotting; confidence region; intersections; structural analysis  
Section Headings: 15 (MISCELLANEOUS & MATHEMATICAL GEOLOGY)

908077 78-39397  
A general probabilistic analysis for three-dimensional wedge failures  
Major, G.; Ross-Brown, D.; Kim, H.  
James and Moore, Denver, Colo., USA  
19th U. S. Symposium on rock mechanics, State line, Nev., United States, May 1-3, 1978  
Symp. Rock Mech., Proc., 19, Vol. 2, 45-56p., 1978  
CODEN: PSRMA6 15 REFS.  
Subfile B  
Country of Publ.: Varies

908077 78-39397  
A general probabilistic analysis for three-dimensional wedge failures  
Major, G.; Ross-Brown, D.; Kim, H.  
James and Moore, Denver, Colo., USA  
19th U. S. Symposium on rock mechanics, State line, Nev., United States, May 1-3, 1978  
Symp. Rock Mech., Proc., 19, Vol. 2, 45-56p., 1978  
CODEN: PSRMA6 15 REFS.  
Subfile B  
Country of Publ.: Varies

908077 78-39397  
A general probabilistic analysis for three-dimensional wedge failures  
Major, G.; Ross-Brown, D.; Kim, H.  
James and Moore, Denver, Colo., USA  
19th U. S. Symposium on rock mechanics, State line, Nev., United States, May 1-3, 1978  
Symp. Rock Mech., Proc., 19, Vol. 2, 45-56p., 1978  
CODEN: PSRMA6 15 REFS.  
Subfile B  
Country of Publ.: Varies

- 908053 78-39286  
**Creep and relaxation of oil shale**  
Chong, K. P.; Smith, J. W.; Khaliki, B.  
Univ. Wyo., Dep. Civ. and Archit. Eng., Laramie, Wyo., USA;  
Laramie Energy Res. Cent., USA  
19th U. S. Symposium on rock mechanics, State Univ., Nev.,  
United States, May, 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 1, 414-418p., 1978  
CODEN: PSRMA6 8 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.: table  
Descriptors: rock mechanics; failure; creep; Green  
River formation; oil shale; models; stress; composition;  
organic materials; uniaxial tests; experimental studies;  
statistical analysis  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 908016 78 39510  
**Finite element analysis of stages of excavation of Helms  
underground powerhouse**  
Willoughby, D. F.; Howland, H. J.  
Pac. Gas and Electr. Co., San Francisco, Calif., USA  
19th U. S. Symposium on rock mechanics, State Univ., Nev.,  
United States, May, 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 1, 159-164p., 1978  
CODEN: PSRMA6 14 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.: tables, sketch map  
Latitude: N363000; Longitude: W1190000; W1194500  
Descriptors: California; rock mechanics; engineering  
geology; excavations; underground installations;  
deformation; Fresno County; United States; Milton Lake;  
Courtright Lake; Lake Wishon; Helms Pumped Storage Project;  
finite element analysis; statistical methods; elasticity;  
strain; failure; stress; hydraulic fracturing  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 908005 78-39337  
**Determining seismic risk for economic optimum slope design**  
Glass, D. E.; Savely, J. P.; Call, R. D.  
Univ. Ariz., Dep. Min. and Geol. Eng., Tucson, Ariz., USA;  
Piercock, Allen & Holt, USA  
19th U. S. Symposium on rock mechanics, State Univ., Nev.,
- United States, May 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 1, 89-94p., 1978  
CODEN: PSRMA6 19 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: mining geology; slope stability; rock  
mechanics; earthquakes; evaluation; landslides;  
excavations; effects; open-pit mining; design;  
statistical analysis; seismic risk  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 908003 78-39338  
**A probabilistic model for shearing resistance of jointed  
rock**  
Glynn, E.; Einstein, H. H.; Veniziano, D.  
Mass. Inst. Technol., Cambridge, Mass., USA  
19th U. S. Symposium on rock mechanics, State Univ., Nev.,  
United States, May 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 1, 66-76p., 1978  
CODEN: PSRMA6 9 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.: table  
Descriptors: rock mechanics; slope stability; fractures  
models; materials; properties; failure; style; stress; joints;  
probability; fracture zones; materials; properties  
strength; shear strength; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

908001 78-39306

**A statistical theory of fragmentation**

Dienes, D. K.  
Los Alamos Sci. Lab., Los Alamos, N.M., USA  
19th U. S. Symposium on rock mechanics, Stateline, Nev.,  
United States, May 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 1, 51-55p., 1978  
CODEN: PSRMA6 5 REFS.

Subfile: B

Country of Publ.: Varies

Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*rock mechanics; failure; fragmentation;  
statistical analysis; theoretical studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

908000 78-39351

**Analysis of discontinuity orientation for a probabilistic slope stability design**

Herget, G.  
Can. Cent. Miner. and Energy Technol., Elliot Lake Lab.,  
Elliot Lake, Ont., CAN  
19th U. S. Symposium on rock mechanics, Stateline, Nev.,  
United States, May 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 1, 42-50p., 1978  
CODEN: PSRMA6 15 REFS.

Subfile: B

Country of Publ.: Varies

Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*slope stability; \*rock mechanics; failure;  
design; site exploration; stabilization; statistical  
analysis; methods; mathematical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

907998 78-39470

**Statistical analysis of laboratory compressive strength and Young's modulus data for the design of production pillars in coal mines**

Sorenson, W. K.; Parisseau, W. G.  
Cont. Oil Co., Ponca City, Okla., USA; Univ. Utah, USA  
19th U. S. Symposium on rock mechanics, Stateline, Nev.,  
United States, May 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 1, 30-37p., 1978  
CODEN: PSRMA6 10 REFS.

Subfile: B

Country of Publ.: Varies

Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*rock mechanics; \*mining geology; materials;  
properties; production control; Young's modulus; pillars;  
compression; elastic constants; strength; materials;  
properties; statistical analysis; engineering geology; coal  
; organic residues; experimental studies; evaluation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

907997 78-39272

**Geomathematical investigation of fault populations at selected locations**

Brooke, J. P.  
San Jose State Univ., Geol. Dep., San Jose, Calif., USA  
19th U. S. Symposium on rock mechanics, Stateline, Nev.,  
United States, May 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 1, 23-29p., 1978  
CODEN: PSRMA6

Subfile: B

Country of Publ.: Varies

Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Descriptors: \*faults; \*rock mechanics; distribution;  
failure; patterns; hydraulic fracturing; models;  
mathematical models; statistical analysis; fracture zones;  
experimental studies; fault zones  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

906579 78-39451

Osnovnye napravleniya issledovaniya ostatochnykh seymodeformatsiy s tsel'yu razrabotki metodiki ikh prognozirovaniya na uchastkakh gidrotekhnicheskogo stroitel'stva

Main directions in investigations of remanent seismic deformations; development of methods of seismic prediction for areas of hydrotechnical structures

Savich, A. I.; Pavlova, I. N.; Gertsik, V. M.; Koptev, V. I.; Yashchenko, Z. G.

Sovremennye seymodislotsii i ikh znachenie dlya seymicheskogo mikroyonirovaniya

Gorshkov, G. P. (EDITOR)

Vspozvuzhnyye soveshchaniye Sovremennyye seymodislotsii i ikh znachenie dlya seymicheskogo mikroyonirovaniya, Moscow, Union of Soviet Socialist Republics, Jan. 25-27, 1972

Publ. Izd Mosk Univ.

141-157p., 1977

Subfile: B

Country of Publ.: Union of Soviet Socialist Republics

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: Russian

illus., table, sketch map

Descriptors: dams; rock mechanics; seismology; design; deformation; seismicity; damage; stress; seismotectonics

; global; 1906-1967; rock masses; statistical analysis

; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905943 78-35856

Analisis del ensayo "limite liquido"

Analysis of the liquid limit test

Pestl, A.

Venez., Univ. Cent., Inst. Mater. Modelos Estructurales, Bol. Tec. 8: 29-30, 71-101p., 1970

9 REFS.

Subfile: B

Country of Publ.: Venezuela

Doc Type: SERIAL; Bibliographic Level: ANALYTIC

Languages: Spanish Summary Languages: English

illus., tables

Descriptors: soil mechanics; techniques; liquid limits;

testing; statistical analysis; Atterberg limits;

applications; interpretation

; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905727 78-33425

Stochastic time-series analysis of volcanic events in central Luzon, Philippines

Gupta, I. M.  
Ebasco Serv., Inc., Greensboro, N.C., USA  
American Geophysical Union, 1977 spring annual meeting, Washington, D.C., United States, May 30-June 3, 1977  
Eos (Am. Geophys. Union, Trans.) 58: 6, 540p., 1977  
CODEN: EOSTAJ  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Latitude: N145000; N145500 Longitude: E1210000; E1201500

Descriptors: \*Philippine Islands; volcanology;

engineering geology; volcanoes; nuclear facilities; Asia;

Luzon; Batuan; site exploration; feasibility studies;

geologic hazards; eruptions; time series; stochastic

processes; rates; statistical analysis; seismicity;

seismic risk; aseismic design

; Section Headings: 05 (PETROLOGY, IGNEOUS AND METAMORPHIC)

905621 78-35844

A new approach for estimating earthquake risk

Omote, S.; Matsumura, K.

Fifth European conference on earthquake engineering, Istanbul, United States, Sept. 22-25, 1975

Eur. Symp. Earthquake Eng., Proc. 5, Vol. 3, 13 p.p., 1975

CODEN: 32ZBAT 13 REFS.

Subfile: B

Country of Publ.: International

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., sketch maps

Latitude: N300000; N450000 Longitude: E1470000; E1290000

Descriptors: \*Japan; engineering geology; earthquakes;

Asia; seismic risk; probability; methods; acceleration;

1985-1974

; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905620 78-35704  
Country of Publ.: International  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages: English  
illus., tables  
Latitude: N350000; N710000 Longitude: E0750000; W0250000  
Descriptors: Europe; engineering geology; earthquakes;  
seismic risk; probability; planning; ground motion;  
structures; building codes; epicenters; accelerometers;  
magnitude; intensity; focus; strong motion; aseismic  
design; attenuation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905620 78-35704  
**Balanced seismic coefficients for sites with different seismicity**  
Grandori, G  
Fifth European conference on earthquake engineering,  
Istanbul, United States, Sept. 22-25, 1975  
Eur. Symp Earthquake Eng., Proc. 5, Vol. 3, 10 p.p.,  
1975  
CODEN 32ZRAT 6 REFS.  
Subfile B

Country of Publ.: International  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages: English  
illus., tables  
Latitude: N363000; N473000 Longitude: E0190000; E0630000  
Descriptors: Italy; engineering geology; earthquakes;  
Europe; seismicity; probability; intensity; planning;  
economics; models; 1400 1972  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905617 78-35715  
**A seismic risk study of Izmir**  
Gulkan, P; Yuceman, M. S.  
Fifth European conference on earthquake engineering,  
Istanbul, Turkey, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc. 5, Vol. 2, 11 p.p.,  
1975  
CODEN 32ZRAT 7 REFS.  
Subfile B

905619 78-35756  
**Seismic zoning of the Balkan region**  
Karnick, V  
Fifth European conference on earthquake engineering,  
Istanbul, United States, Sept. 22-25, 1975  
Eur. Symp Earthquake Eng., Proc. 5, Vol. 3, 12 p.p.,  
1975  
CODEN 32ZRAT 9 REFS.  
Subfile B

Country of Publ.: International  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages: English  
illus., table, sketch map  
Latitude: N382000; N384000 Longitude: E0272000; E0270000  
Descriptors: Turkey; engineering geology; earthquakes;  
Middle East; seismic risk; Bayesian analysis; probability;  
intensity; Izmir; ground motion; response; attenuation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Country of Publ.: International  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages: English  
illus., sketch map  
Latitude: N360000; N460000 Longitude: E0300000; E0140000  
Descriptors: Balkan Peninsula; engineering geology;  
earthquakes; Europe; seismic risk; acceleration; ground  
motion; velocity; probability; epicenters; intensity;  
mechanism; Karlik, V  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905618 78-35613  
**Trends in engineering seismology in Europe**  
Abramses, N. N.  
Fifth European conference on earthquake engineering,  
Istanbul, United States, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc. 5, Vol. 3, 14 p.p.,  
1975  
CODEN 32ZRAT 18 REFS  
Subfile B

905618 78-35613  
**Trends in engineering seismology in Europe**  
Abramses, N. N.  
Fifth European conference on earthquake engineering,  
Istanbul, United States, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc. 5, Vol. 3, 14 p.p.,  
1975  
CODEN 32ZRAT 18 REFS  
Subfile B

905616 78-35708

**Migration of destructive earthquakes in Middle America and associated risk of occurrence**

Grases, J. G.  
Fifth European conference on earthquake engineering.  
Istanbul, Turkey, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc. 5, Vol. 2, 5 p.p., 1975  
CODEN: 32ZRAT 4 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., sketch maps  
Descriptors: \*Central America; engineering geology; earthquakes; distribution; patterns; migration; seismic risk; 1700-1973; seismicity; probability  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905614 78-35610

**Probability distribution of earthquake accelerations for sites in western Germany**

Aherner, L.; Rosenhauer, W.  
Fifth European conference on earthquake engineering.  
Istanbul, Turkey, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc. 5, Vol. 2, 7 p.p., 1975  
CODEN: 32ZRAT 4 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, sketch maps  
Latitude: N490000; Longitude: E0100000; E0040000  
Descriptors: \*West Germany; engineering geology; earthquakes; Germany; Europe; effects; acceleration; probability; seismic risk; 1750-1969; seismicity; computer programs; buildings; urban planning; Rhine Basin  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905613 78-35900

**Seismic risk analysis: California State Water Project**

Shah, H. C.; Movassate, M.  
Stanford Univ., Stanford, Calif., USA  
Fifth European conference on earthquake engineering.  
Istanbul, Turkey, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc. 5, Vol. 2, 14 p.p., 1975  
CODEN: 32ZRAT

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., sketch maps  
Latitude: N323000; Longitude: W1141500; W1243000  
Descriptors: \*California; engineering geology; earthquakes; United States; seismic risk; California State water Project; probability; acceleration; water resources  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905575 78-35669

**Finite element grids for dynamic response analysis**  
Dezfulian, H.  
Fifth European conference on earthquake engineering.  
Istanbul, Turkey, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc. 5, Vol. 1, 5 p.p., 1975  
CODEN: 32ZRAT 3 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: \*soil mechanics; materials; properties; dynamic properties; materials, properties; response; finite element analysis; statistical methods; acceleration  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905574 78-35787

**An application of finite element method to soil-foundation interaction analysis**

Kurthyashi, E.; Iida, Y.  
Fifth European conference on earthquake engineering, Istanbul, Turkey, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc., 5, Vol. 1, 5 p.p., 1975

CODEN: 32ZRAT 1 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION  
Level: ANALYTIC  
Languages: English  
illus.

Latitude: N395700; N341000 Longitude: E1310000; E1304500  
Descriptors: \*Japan; \*soil mechanics; engineering geology; materials; properties; foundations; elastic moduli; Asia; Honshu; Kyushu; Shimoseki; Woji; bridges; piers; dynamics; amplitude; finite element analysis; statistical methods; S-waves; velocity; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905572 78-35611

**Earthquake analysis of Keban Dam**

Akay, H. U.; Gulkan, P.  
Fifth European conference on earthquake engineering, Istanbul, Turkey, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc., 5, Vol. 1, 12 p.p., 1975

CODEN: 32ZRAT 10 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION  
Level: ANALYTIC  
Languages: English  
illus.

Latitude: N360000; N390000 Longitude: E0420000; E0370000  
Descriptors: \*Turkey; engineering geology; dams; earthquakes; Middle East; southeast; Euphrates River; Keban Dam; Keban; effects; rockfill dams; finite element analysis; statistical methods; seismic risk; response; simulation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905560 78-35834

**Earthquake response of continuous media using dynamic relaxation**

Nimovski, N.; Petrovski, D.  
Fifth European conference on earthquake engineering, Istanbul, Turkey, Sept. 22-25, 1975

1975  
Eur. Symp. Earthquake Eng., Proc., 5, Vol. 1, 5 p.p., 1975

CODEN: 32ZRAT 3 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION  
Level: ANALYTIC  
Languages: English  
illus.

Descriptors: earthquakes; soil mechanics; effects; materials; properties; response; dynamic properties; mathematical methods; numerical analysis; finite element analysis; statistical methods; continuous media; two-dimensional models; elastic materials; homogeneous media; isotropic materials; strain; elastoviscous materials; viscosity; shear modulus; elastic constants; displacements; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905559 78-35723

**Behaviors of the alluvial layers on the sloped bed rock during earthquakes**

Hamada, M.; Fujita, H.  
Taisei Corp., JPN  
Fifth European conference on earthquake engineering, Istanbul, Turkey, Sept. 22-25, 1975  
Eur. Symp. Earthquake Eng., Proc., 5, Vol. 1, 5 p.p., 1975

CODEN: 32ZRAT 2 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION  
Level: ANALYTIC  
Languages: English  
illus.; sect.

Latitude: N344500; N351500 Longitude: E1360000; E1353000  
Descriptors: \*Japan; \*soil mechanics; engineering geology; materials; properties; earthquakes; alluvium; effects; clastic sediments; materials; properties; inclined materials; acceleration; numerical analysis; Asia; Osaka; Honshu; displacements; mathematical models; models; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905553 78-35840

**Empirical liquefaction index for sands**

Nimmally, S. W.; Krizek, R. J.; Edil, T. B.  
 Univ. Fla., Dep. Civ. Eng., Gainesville, Fla. USA;  
 Northwestern Univ., USA  
 Fifth European conference on earthquake engineering,  
 Istanbul, Turkey, Sept. 22-25, 1975  
 Eur. Symp. Earthquake Eng., Proc. 5, Vol. 1, 14 p.p.,  
 1975  
 CODEN: 32ZRAT 15 REFS.  
 Subfile B

Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus., tables, sects.  
 Descriptors: soil mechanics; materials; properties;  
 sand; materials; properties; clastic sediments;  
 liquefaction; statistical analysis; saturated materials;  
 cohesionless materials; fine-grained materials; loading;  
 grain size; acceleration; pore pressure  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905550 78-35831

**Effect of groundwater and relief on seismicity of soils**

Napetvaridze, S. G.; Jabauri, G. G.; Gogelia, T. I.  
 Fifth European conference on earthquake engineering,  
 Istanbul, Turkey, Sept. 22-25, 1975  
 Eur. Symp. Earthquake Eng., Proc. 5, Vol. 1, 8 p.p.,  
 1975  
 CODEN: 32ZRAT

Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus., sects.  
 Descriptors: soil mechanics; earthquakes; ground water;  
 materials; properties; effects; movement; saturated  
 materials; seismicity; materials; properties; intensity;  
 building codes; water table; depth; wave fronts; elastic  
 waves; reflection; acceleration; dynamic properties;  
 finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

905270 78-34555

**Finite element analysis of the temperature distribution  
 within a Griggs apparatus sample assembly**

Nelson, D.  
 Brown Univ., Dep. Geol. Sci., Providence, R.I., USA  
 American Geophysical Union: 1977 Spring annual meeting.

Washington, D.C., United States, May 30-June 3, 1977  
 Eos (Am. Geophys. Union, Trans.) 58: 6, 513p., 1977  
 CODEN: EOSTAJ

Subfile B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Descriptors: geophysics; instruments; Griggs apparatus;  
 deformation; rock mechanics; experimental studies; P-T  
 conditions; temperature; high temperature; finite element  
 analysis; statistical methods  
 Section Headings: 17 (GEOPHYSICS, GENERAL)

905022 78-35907

**Statistical estimates of the likelihood of earthquake  
 shaking throughout New Zealand**

Smith, W. D.  
 N. Z. Soc. Earthquake Eng., Bull. 9: 4, 213-22 p., 1976  
 CODEN: NZEBA3 7 REFS.  
 Subfile: B

Country of Publ.: New Zealand  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table, sketch maps  
 Latitude: S473000; S343000 Longitude: E1783000; E1663000  
 Descriptors: New Zealand; engineering geology;  
 earthquakes; Australasia; statistical analysis; intensity;  
 isoseismals; modified Mercalli scale; attenuation; seismic  
 risk  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

904283 78-35993

**Retreat of cliff coastline in the Kilkeel area of County Down**

McGreal, W. S.  
The Queen's Univ. of Belfast, Belfast, GB  
490p., 1977  
Subfile B  
Degree Level: Doctoral  
Country of Publ.: United Kingdom  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Latitude: N540500; Longitude: W0061500  
Latitude: N540500; Longitude: W0061500  
Descriptors: \*Northern Ireland; \*geomorphology  
Engineering geology; shore features; shorelines; cliffs;  
Europe; Down; Kilkeel; erosion; conservation; processes;  
1973-1975; environmental geology; sediments; engineering  
properties; statistical analysis  
Section Headings: 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

904035 78-35746

**A quantitative model of dilatancy in dry rock and its application to Westerly Granite**

Holcomb, D. J.  
Univ. Colo./NOAA, Coop. Inst. Res. Environ. Sci., Boulder, Colo., USA  
American Geophysical Union; 1977 spring annual meeting.  
Washington, D.C.; United States, May 30-June 3, 1977  
Eos (Am. Geophys. Union, Trans.) 58: 6, Suppl., 1977  
CODEN: EOSTAU  
Subfile B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*rock mechanics; materials; properties; granite; Westerly Granite; dilatancy; granite; granodiorite family; stress; statistical analysis; quantitative analysis; fractures; cracks; strain; dry rocks; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

903657 78-35938

**Modeling crack distributions in low porosity rocks**

Timpano, M.; Warren, N.  
Univ. Calif., Inst. Geophys. and Planet. Phys., Los Angeles, Calif., USA  
American Geophysical Union; 1977 fall annual meeting. San Francisco, Calif.; United States, Dec. 5-9, 1977  
Eos (Am. Geophys. Union, Trans.) 58: 12, 1223p., 1977  
CODEN: EOSTAU

Subfile B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*fractures; \*structural analysis; \*deformation; \*rock mechanics; distribution; theoretical studies; compressibility; cracks; open fractures; porosity; models; mathematical models; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

903393 78-34320

Va. Polytech Inst., Dep. of Stat., USA  
**Probability and statistics for engineers and scientists**  
Walpole, R. E.; Myers, R. H.  
Roanoke Coll., Dep. of Math. and Stat., Roanoke, Va., USA  
Publ. Macmillan Publ. Co.  
580p., 1978  
ISBN: 0024241105 Ed. 2

Subfile B  
Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: MONOGRAPHIC  
Languages: English  
Note: First edition 1972, illus., tables  
Descriptors: \*mathematical geology; textbooks; statistical methods; probability; applications; engineering geology  
Section Headings: 15 (MISCELLANEOUS & MATHEMATICAL GEOLOGY)

902184 78 35576

Ein stochastisches Modell fuer die Beschreibung des Durchbruchverhaltens eines Festbettsystems mit Stoffaustausch  
A stochastic model for the description of the breakdown of a packed bed system by material exchange

Sedlacek, M  
Eidgenoessisch. Tech. Hochschule Zuerich, Zuerich, CHE  
88p. 1975  
62 REFS

Subfile: B  
Degree Level: Doctoral  
Country of Publ.: Switzerland  
Doc Type: IJESIS Bibliographic Level: MONOGRAPHIC  
Languages: German  
Availability: Univ. Microfilms  
illus.: tables  
Descriptors: \*automatic data processing; \*engineering geology; methods; materials; properties; stochastic models; packet bed systems; statistical analysis; stochastic processes; solution; experimental studies; Monte Carlo analysis; theoretical studies; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

902190 78 35727

Virtual mass of coarse granular media  
Mannour, A. A.; McCorquodale, J. A.  
Am. Soc. Civ. Eng. Proc., J. Waterw., Port., Coastal Ocean Div. 104 WW2, 191-200p., 1978  
CODEN: JMWFAU 28 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: \*rock mechanics; \*shorelines; materials; properties; hydraulics; sediments; experimental studies; materials; properties; virtual mass; breakwaters; statistical analysis; gravel; clastic sediments; crushed rock; stabilization  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

901265 78 31439

Pit slope manual supplement 4-1; Computer manual for seepage analysis  
Marion Lambert, J.  
Can., Cent. Miner. Energy Technol., CANMET Rep. 77-30., 97 p., 1977

CODEN: CANRD7  
Subfile: B  
Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC

Languages: English  
illus.

Descriptors: \*automatic data processing; \*slope stability; \*ground water; \*mining geology; engineering geology; excavations; movement; methods; computer programs; seepage; FEPPM; analysis; flow; rates; porous materials; permeability; finite element analysis; statistical methods; open-pit mining; application  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

901221 78-31752

Zur Geologie und Statistik des Tunnelbaus in Baden-Wuerttemberg unter besonderer Beruecksichtigung der Keupertunnele  
The geology and statistics of tunnel structure in Baden-Wuerttemberg with particular emphasis on the Keuper Tunnels  
Krause, H.  
Baden-Wuertemb., Geol. Landesamt, Jahresh. 19, 35-57p., 1977  
CODEN: JGIBAV 37 REFS.

Subfile: B  
Country of Publ.: Germany, Federal Republic of  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: German Summary Languages: French  
illus.: table, sect.  
Latitude: N473000; N494500 Longitude: E0102000; [0073000  
Descriptors: \*West Germany; engineering geology; tunnels; Germany; Europe; Baden-Wuerttemberg; Claystone; Clastic rocks; Triassic; Mesozoic; Keuper; Upper Triassic; stability; rock mechanics; ground water; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

901191 78-31821  
**Impact of a low permeable grain on shore-zone geometry**  
Dime, A. R.  
Univ. Calif., Dep. Geogr., Los Angeles, Calif., USA

**Research techniques in coastal environments**  
Walker, H. J. (EDITOR)  
Geosci. Man 18, 81-95p., 1977  
CODEN: GSCMA2  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, Geol., sketch maps  
Latitude: N340000; N341000 Longitude: W1191000  
Descriptors: \*California; engineering geology;  
shorlines; Ventura County; United States; breakwaters;  
Point Mugu; effects; sedimentation; factor analysis;  
statistical methods; slopes; beaches; spectral analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

900807 78-31460  
**Investigation of the bearing capacity of fill**  
Richards, B. G.  
Aust., CSIRO, Div. Appl. Geomech., Tech. Rep. 29, 44p., 1976  
CODEN: AAGRCH 4 REFS.  
Subfile: B  
Country of Publ.: Australia  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus., tables  
Descriptors: soil mechanics; materials; properties;  
bearing capacity; materials; properties; fill; stress;  
models; mathematical models; experimental studies; triaxial tests; finite element analysis; statistical methods;  
permeability; New South Wales; Australia; Cobar  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

898652 78-31651  
**Decision analysis applied to rock tunnel exploration**  
Einstein, H. H.; Labrecque, D. A.; Markow, M. J.; Baecher, G.  
Near surface underground opening design  
Judd, W. R. (EDITOR)  
Site characterization; 17th U. S. symposium on rock mechanics, Snowbird, Utah, United States, Aug. 25-27, 1976  
Eng. Geol. 12 2, 143-161p., 1978  
CODEN: EGNQAO A REFS  
Subfile: B

Country of Publ.: International  
Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: \*tunnels; engineering geology; site exploration; statistical methods; decision methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

898431 78-31959  
**Probability analysis of rock slopes and its application to a pit slope design**  
Young, D. S.  
Kennecott Copper Corp., Salt Lake City, Utah, USA  
**Energy resources and excavation technology: proceedings, 18th U. S. symposium on rock mechanics**  
Wang, F. D. (EDITOR); Clark, G. B. (EDITOR)  
Energy resources and excavation technology; 18th U. S. symposium on rock mechanics, Keystone, Colo., United States, June 22-24, 1977  
Publ. Colo. Sch. Mines Press  
5C5.1-5C5.6p., 1977  
5 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: slope stability; failure; site exploration; methods; statistical analysis; probability; excavations; design  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

898427 78-31574

**Statistical description of rock properties and sampling**

Raecher, G. B.; Einstein, H. H.; Lanney, N. A.  
Mass. Inst. Technol., Cambridge, Mass., USA

**Energy resources and excavation technology; proceedings, 18th U. S. symposium on rock mechanics**

Wang, F. D. (EDITOR); Clark, G. B. (EDITOR)

Energy resources and excavation technology; 18th U. S. symposium on rock mechanics. Keystone, Colo., United States. June 22-24, 1977

Publ. Colo. Sch. Mines Press  
SCI 1 5CT.8p . 1977  
15 REFS.

Subfile B

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English

illus., tables

Descriptors: rock mechanics; materials; properties; joints; materials; properties; models; statistical analysis

; fractures; mathematical models

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

898410 78-31923

**Site specific studies for possible ongoing salt dome movement**

Thoms, R. L.; Gehle, R. M.; Manning, T. A.; Paille, L. K.  
La. State Univ., Baton Rouge, La., USA

**Energy resources and excavation technology; proceedings, 18th U. S. symposium on rock mechanics**

Wang, F. D. (EDITOR); Clark, G. B. (EDITOR)

Energy resources and excavation technology; 18th U. S. symposium on rock mechanics. Keystone, Colo., United States. June 22-24, 1977

Publ. Colo. Sch. Mines Press  
486.1-486.1p . 1977  
55 REFS.

Subfile D

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English

illus.

Latitude: N250000; W310000 Longitude: W0790000; W0980000

Descriptors: Gulf Coastal Plain; engineering geology; structural geology; waste disposal; salt tectonics; North America; radioactive waste; site exploration; salt domes;

storage; instruments; finite element analysis; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

898408 78-31783

**Stability of a radioactive waste repository in the Canadian Shield**

Mahtab, M. S.; McCreath, D. R.; Ratigan, J. L.  
Acres Consult. Serv., Niagara Falls, CAN; RE/SPEC, USA

**Energy resources and excavation technology; proceedings, 18th U. S. symposium on rock mechanics**

Wang, F. D. (EDITOR); Clark, G. B. (EDITOR)

Energy resources and excavation technology; 18th U. S. symposium on rock mechanics. Keystone, Colo., United States. June 22-24, 1977

Publ. Colo. Sch. Mines Press  
484.1-484.6p . 1977  
12 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English

illus., tables

Latitude: N480000; N570000 Longitude: W0700000; W1200000

Descriptors: Canadian Shield; engineering geology; underground installations; Canada; North America; stability

; failure; storage; waste disposal; radioactive waste; finite element analysis; statistical methods; loading; stress

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

898397 78-31776

**Probability of specified ground vibrations from blasting**

Lutton, R. J.  
USAE Waterways Exp. Stn., Vicksburg, Miss., USA

**Energy resources and excavation technology; proceedings, 18th U. S. symposium on rock mechanics**

Wang, F. D. (EDITOR); Clark, G. B. (EDITOR)  
Energy resources and excavation technology: 18th U. S. symposium on rock mechanics, Keystone, Colo., United States, June 22-24, 1977  
Publ. Colo. Sch. Mines Press  
362 1-362 7p., 1977  
7 REFS.

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English

illus., tables, sect

Descriptors: explosions; effects; ground motion; construction; elastic waves; velocity; vibration

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

898315 78-31562

**Probability distribution of earthquake accelerations with applications to sites in the northern Rhine area, Central Europe**

Aherner, L.; Rosenhauer, W.  
J. Geophys. 41: 6, 581-594p., 1975  
CODEN: JGEND4 16 REFS.

Country of Publ.: Germany, Federal Republic of

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

Lat. Long.: 51° 10' N, 10° 00' E

Longitude: E0100000; E0040000

Descriptors: West Germany; seismology; engineering geology; seismicity; earthquakes; Germany; Europe; North Rhine Westphalia; seismic risk; site exploration; Belgium; Lower Rhine Graben; acceleration; nuclear facilities; Inesse; Rhineland Palatinate; statistical analysis; magnitude; epicenters

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

898165 78-31843

**Slope stability analysis and design based on probability techniques at Cassiar Mine**

Pitman, D. R.; Martin, D. C.  
D. R. Pitman and Assoc. Ltd., West Vancouver, B. C., USA  
Can. Inst. Min. Met., Trans., 80, 51-62p., 1977

CODEN: TCIMAT 5 REFS.

Subfile: B

Country of Publ.: Canada

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus., tables, sects

Latitude: N650000; N612000 Longitude: W1260000; W1320000

Descriptors: mining geology; slope stability; British Columbia; practice; site exploration; engineering geology

open-pit mining; Cassiar Mine; Sylvester Group; ground water; rock mechanics; design; Canada

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

898076 78-32246

**Automatic identification of soil parent materials using quantitative terrain factors**

Khoury, M. A.  
Univ. of Illinois, Urbana, Ill., USA  
330p., 1977

Subfile: B

Degree Level: Doctoral

Country of Publ.: United States

Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Languages: English

Availability: Univ. Microfilms

Descriptors: automatic data processing; soils; engineering geology; maps; genesis; cartography; parent materials; identification; quantitative analysis; terrain classification; statistical analysis; till; clastic sediments; loess; limestone; carbonate rocks; mapping; field studies

Section Headings: 25 (SURFICIAL GEOLOGY, SOILS)

897853 78-27887

**Statistical interpretation of shock series in mining**

Marcak, H.  
Rock Mech. (Vienna) 10 4, 181-186p., 1978  
CODEN: RHMVMS 4 REFS

Subfile: B

Country of Publ.: International

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English Summary Languages: German

illus

Descriptors: mining geology; seismology; rock mechanics; methods; microseisms; statistical methods; interpretation

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

896867 78-27981

Methodische Probleme bei der Ermittlung strukturgeologischer  
 Primärdaten im Fels und ihrer Weiterverarbeitung zu  
 statistischen Kenngrößen des Gesteinsverbands  
 Methodical problems of determining structural-geological  
 primary data in rock and their further processing into  
 statistical characteristics of rock associations

Richter, H. C.; Molek, H.; Reuter, F.  
 Z. Angew. Geol. 22, 5, 238-243p., 1976  
 CODEN: ZANGAK 4 REFS

Subfile: B  
 Country of Publ.: German Democratic Republic  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: Russian  
 illus: tables

Descriptors: \*rock mechanics; \*structural geology;  
 \*petrology; methods; statistical methods; classification  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

896528 78 27621

Earth anchors; load transfer analysis using photoelastic,  
 analytic and finite element methods

Priestorfer, L. A.  
 Princeton Univ., Princeton, N. J., USA  
 371p., 1978

Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms

Descriptors: \*soil mechanics; techniques; anchors;  
 experimental studies; theoretical studies; loading; finite  
 element analysis; statistical methods; methods; earth  
 anchors; photoelastic models; elasticity; models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

896513 78 27009

Numerical models of crustal deformation

Kosloff, D.  
 California Inst. of Technol., Pasadena, Calif., USA  
 226p., 1978

Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms

Latitude: N390000; N390000 Longitude: W1170000; W1220000  
 Descriptors: \*California; tectonophysics; engineering  
 geology; crust; land subsidence; Los Angeles County;

United States; Southern California; San Andreas Fault;  
 Transverse Ranges; Long Beach; Wilmington Field; plate  
 tectonics; mechanism; stress; numerical analysis; finite  
 element analysis; statistical methods; theoretical studies;  
 mathematical models; models; lithosphere; rheology;  
 elasticity; plasticity; island arcs; sonmounts; oil and  
 gas fields; Palmdale Bulge; uplifts  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

896510 78-27609

Finite element analysis of seismic scattering problems

Day, S. M.  
 Univ. of California, San Diego, La Jolla, Calif., USA  
 165p., 1977

Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Availability: Univ. Microfilms

Descriptors: \*seismology; \*foundations; \*geophysical methods  
 ; elastic waves; theoretical studies; seismic methods;  
 propagation; response; interpretation; scattering; finite  
 element analysis; statistical methods; numerical analysis;  
 geometry; engineering geology; Fourier analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

896357 78-27977

**Die Varianzanalyse und ihre Anwendung fuer geologische Zwecke**  
**Variance analysis and its application for geological purposes**  
Rasemann, W.

**Mathematische Probleme der Geologie**

Rasemann, W.  
Freiberg. Forschunghsh., Reihe C 286, 73-100p., 1975  
CODRN FERCAD 54 REFS.  
Subfile: B  
Country of Publ.: German Democratic Republic  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: German Summary Languages: English  
tables  
Latitude: N503000; N510000 Longitude: E0112000; E0101000  
Descriptors: \*East Germany; \*engineering geology; petroleum engineering; reservoir rocks; mathematical geology; variance analysis; statistical methods; Bunter; Lower Triassic; Thuringian Basin; Germany;  
Europe  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

896358 78-27976

**Anwendung mathematisch-statistischer Modelle fuer geologische Zwecke am Beispiel der physikalischen Bewertung von Speichergesteinen**  
**Application of mathematical-statistical models for geological purposes; example of the physical evaluation of reservoir rocks**  
Rasemann, W.

**Mathematische Probleme der Geologie**

Rasemann, W.  
Freiberg. Forschunghsh., Reihe C 286, 5-71p., 1975  
CODRN FERCAD 115 REFS.  
Subfile: B  
Country of Publ.: German Democratic Republic  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: German Summary Languages: English  
illus., plates, tables  
Latitude: N503000; N510000 Longitude: E0112000; E0101000  
Descriptors: \*East Germany; \*engineering geology; petroleum engineering; reservoir rocks; mathematical models; models; statistical methods; Bunter; Lower Triassic; Thuringian Basin; Germany; Europe; porosity; permeability  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Mathematische Probleme der Geologie**  
**Mathematical problems in geology**

Rasemann, W.  
Freiberg. Forschunghsh., Reihe C 286, 100p., 1975  
CODRN FERCAD 169 REFS.

Subfile: B

Country of Publ.: German Democratic Republic  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: German Summary Languages: English  
Note: Includes separate articles by Rasemann which are cited herein, illus., plates, tables  
Latitude: N503000; N510000 Longitude: E0112000; E0101000  
Descriptors: \*East Germany; \*engineering geology; petroleum engineering; reservoir rocks; mathematical models; models; statistical methods; Bunter; Lower Triassic; Thuringian Basin; Germany; Europe; porosity; permeability; variance analysis; mathematical geology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

895769 78-27856

**Statistical forecasting of compressibility of peaty ground**

Kogure, K.; Ohira, Y.  
Can. Geotech. J. 14: 4, 562-570p., 1977  
CODRN CGJDAH 11 REFS.

Subfile: B

Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus., tables  
Descriptors: \*foundations; \*soil mechanics; materials; properties; peat; settlement; compression; statistical methods; consolidation; organic sediments; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894786 78 28043  
**Stresses and strains in non-linear viscous soils**  
 Suklje, L  
 Int. J. Numer. Anal. Methods Geomech. 2, 2, 129-158p., 1978  
 ISSN 0303-9061 8 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type SERIAL Bibliographic Level ANALYTIC  
 Languages English  
 illus.  
 Descriptors: \*soil mechanics; materials; properties; viscous materials; elasticity; plasticity; stress; strain; elastoplastic materials; non-linear materials; computer programs; creep; finite element analysis; statistical methods; loading; numerical analysis; consolidation; triaxial tests; clays; displacements; materials, properties  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894747 78 28066  
**Statistical analysis of the computed response of structural response recorders (SRR) for accelerograms recorded in the United States of America**  
 Trifunac, M. D  
 Univ. South. Calif., Dep. Civ. Eng., Los Angeles, Calif., USA  
 Sixth world conference on earthquake engineering, New Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2956-2961p., 1977  
 2 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
 Languages English  
 illus., tables  
 Latitude: N270000 Longitude: W1000000; W1250000  
 Descriptors: \*Western U.S.; engineering geology; earthquakes; United States; accelerograms; response; structures; strong motion; statistical analysis; 1933-1971; modified Mercalli scale; intensity; seismographs  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894714 78-28018  
**A stochastic method for seismic stability evaluation of earth structures with strain dependent properties**  
 Singh, M. P.; Agrawal, P. K.  
 Sargent & Lundy, Chicago, Ill., USA  
 Sixth world conference on earthquake engineering, New Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2363-2368p., 1977  
 6 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
 Languages English  
 Descriptors: \*foundations; soil mechanics; structures; materials; properties; stability; dynamic properties; stochastic methods; strain; damping; shear modulus; elastic constants; response; loading; accelerograms; finite element analysis; statistical methods; numerical analysis; examples; earthdams; materials, properties  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894722 78-27863  
**Effects of site conditions on floor response spectra**  
 Kumar, R. R.; Beresford, P. J.  
 Dames & Moore, London, GBR  
 Sixth world conference on earthquake engineering, New Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2600-2608p., 1977

894712 78 27744

**Plane vibrations of saturated soil in structural foundation**  
 Eskin, J. M.; Fister, L. A.  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2350-2355p., 1977  
 2 REFS.

Subfile: B  
 Country of Publ.: International  
 Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: foundations; soil mechanics; structures;  
 materials; properties; saturated materials; response;  
 vibration; one-dimensional models; models; layered media;  
 stability; numerical analysis; stress; loading; finite  
 element analysis; statistical methods; elastic waves;  
 propagation; materials; properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894702 78-28089

**Use of analytical and statistical techniques to assess  
 in-situ soil test procedures**  
 Werner, S. D.; Van Dillen, D.  
 Aghabian Assoc., El Segundo, Calif., USA  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2291-2296p., 1977  
 2 REFS.

Subfile: B  
 Country of Publ.: International  
 Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.; sects.  
 Descriptors: soil mechanics; materials; properties;  
 shear modulus; materials, properties; in situ; strain;  
 elastic constants; finite element analysis; statistical  
 methods; response; sand; clastic sediments; boreholes  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894639 78-27915

**The seismic behaviour of river valleys**  
 Moss, P. J.; Carr, A. J.  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2274-2279p., 1977  
 2 REFS.

Subfile: B  
 Country of Publ.: International

Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.; table, sects.  
 Descriptors: soil mechanics; foundations; applications;  
 bridges; response; valleys; seismic response; finite  
 element analysis; statistical methods; acceleration;  
 alluvium; clastic sediments  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894698 78-27655

**Boundary conditions in soil amplification studies**  
 Ayala, G. A.; Aranda, G. R.  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2268-2273p., 1977  
 6 REFS.

Subfile: B  
 Country of Publ.: International  
 Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.; sects.  
 Descriptors: soil mechanics; materials; properties;  
 response; elastic waves; propagation; amplitude; numerical  
 analysis; seismic response; materials, properties;  
 transmission; one-dimensional models; models; mathematical  
 models; shear stress; S-waves; body waves; semi-infinite  
 media; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894697 78-27946  
 Study of effects of a berm on the stability on rockfill dams during earthquakes  
 Yamamoto, S.; Tamura, C.; Oimachi, T.; Kato, K.  
 Sixth world conference on earthquake engineering. New Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2232-2237p., 1977  
 3 REFS  
 Country of Pub.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English

894677 78-27753  
 Seismic analysis of dam-reservoir-foundation systems  
 Finn, W. D. L.; Varoglu, E.  
 Sixth world conference on earthquake engineering. New Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2392p., 1977  
 Subfile: B  
 Country of Pub.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: dams; foundations; response; reservoirs; half-space; elastic materials; infinite media; soil mechanics; acceleration; finite element analysis; statistical methods; layered media  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894687 78-28111  
 Soil liquefaction analysis based on field observations  
 Nogian, M. K.; Whitman, R. V.  
 Northeast Univ., Dep. Civ. Eng., Boston, Mass., USA; Mass. Inst. Technol., USA  
 Sixth world conference on earthquake engineering. New Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 2441-2447p., 1977  
 3 REFS  
 Subfile: B  
 Country of Pub.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: With discussion, illus.  
 Descriptors: earthquakes; soil mechanics; effects; materials; properties; liquefaction; dynamic properties; acceleration; magnitude; intensity; shear stress; pore pressure; statistical analysis; probability; new methods; Liquefaction Potential Index; materials; properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894680 78-28049  
 Characteristics of semi-infinite element and its application to dynamic problem  
 Ishiwaki, N.; Takegawa, Y.; Iguro, H.  
 Shimizu Constr. Co., Tokyo, JPN

894674 78 27942  
**Ground behaviors from numerical calculations and dynamic tests**  
 Dhashi, M.  
 Sixth world conference on earthquake engineering. New Delhi, India. Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6. 2389p.. 1977  
 1 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.. sect. sketch map  
 Latitude: N110000; S050000 Longitude: E1160000; E1060000  
 Descriptors: \*soil mechanics; \*Indonesia; materials; properties; engineering geology; liquefaction; earthquakes; Java; coastal environment; probability; subduction zones; magnitude; effects; ground motion; triaxial tests; experimental studies; cyclic processes; strength; case studies; materials; properties; Attenuation; Asia  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894656 78-27710  
**Likelihood of liquefaction**  
 Chou, I. H.; Oguntala, A.  
 Dams & More, Cranford, N.J., USA  
 Sixth world conference on earthquake engineering. New Delhi, India. Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6. 2183-2188p.. 1977  
 16 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*soil mechanics; \*earthquakes; materials; properties; effects; liquefaction; materials; properties; stochastic processes; probability; statistical analysis; loading; saturated materials; ground motion; water table; depth  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894659 78-28051  
**Evaluation of liquefaction potential of sandy deposits by a statistical method**  
 Inamoto, K.  
 Sixth world conference on earthquake engineering. New Delhi, India. Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6. 2201-2206p.. 1977  
 3 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.. tables  
 Descriptors: \*soil mechanics; \*earthquakes; materials; properties; effects; liquefaction; materials; properties; sand; clastic sediments; granular materials; statistical analysis; water table; acceleration  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894658 78 27717  
**Probabilistic evaluation of liquefaction with an application to a site near a subduction zone**  
 Grouse, C. B.; Guzman, R.; Espana, C.  
 Fugro Inc., Long Beach, Calif., USA  
 Sixth world conference on earthquake engineering. New Delhi, India. Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6. 2195-2200p.. 1977  
 4 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*soil mechanics; \*earthquakes; materials; properties; effects; liquefaction; materials; properties; sand; clastic sediments; granular materials; statistical analysis; water table; acceleration  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 894637 78-28076  
**Dynamic and earthquake analysis of some shear wall structures with openings and wall diaphragm frames considering the unequal settlement's effect of foundation soil**  
 Ungureanu, N.; Clongrad, I.  
 Sixth world conference on earthquake engineering. New Delhi, India. Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 1712p., 1977  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Descriptors: foundations; earthquakes; soil mechanics; settlement; effects; materials; properties; raft foundations; dynamic properties; structures; finite element analysis; statistical methods; materials; properties; response  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 894636 78-28073  
**Elastic-plastic dynamic analysis of soil-foundation-structure interaction**  
 Ukaji, K.; Hoeg, K.; Shah, H. C.  
 Ohbayashi-Gumi Ltd., Tokyo, JPN; Stanford Univ., USA  
 Sixth world conference on earthquake engineering. New Delhi, India. Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 1711p., 1977  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Descriptors: earthquakes; foundations; soil mechanics; effects; structures; materials; properties; response; dynamic properties; finite element analysis; statistical methods; elastoplastic materials; stress; strain; elasticity; loading; materials; properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 894635 78-27777  
**Studies on practical idealization of soil-pile-group system concerning dynamic interaction**  
 Goto, Y.  
 Ohbayashi-Gumi Ltd., Tokyo, JPN  
 Sixth world conference on earthquake engineering. New Delhi, India. Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 1710p., 1977  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic
- 894633 78-27864  
**An application of finite element method to soil-foundation interaction analyses**  
 Kuribayashi, E.; Iida, Y.  
 Sixth world conference on earthquake engineering. New Delhi, India. Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 1708p., 1977  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Latitude: N340000; N341500 Longitude: E1310000; E1304500  
 Descriptors: Japan; engineering geology; foundations; Asia; bridges; Kanmon Bridge; Honshu; Kyushu; elasticity; dynamic properties; finite element analysis; statistical methods; Shimonoseki; Moji  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- Level: ANALYTIC  
 Languages: English  
 Descriptors: foundations; soil mechanics; earthquakes; bridges; materials; properties; effects; response; dynamic properties; piles; experimental studies; physical models; models; finite element analysis; statistical methods; three-dimensional models; materials; properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894618 78-27838  
**Soil-pile-structure-field interaction under seismic loads**  
 Kamil, H.; Kost, G.; Gantayat, A.  
 Eng. Decis. Anal. Co., Palo Alto, Calif., USA  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 1590-1595p., 1977  
 15 REFS  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*foundations; \*soil mechanics; piles;  
 materials; properties; response; loading; finite element  
 analysis; statistical methods; structures; fluid mechanics;  
 materials; properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894612 78-28096  
**Soil-structure interaction in nuclear power plants: a comparison of methods**  
 Wight, L. H.  
 Univ. Calif., Lawrence Livermore Lab., Livermore, Calif.,  
 USA  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 1549-1554p., 1977  
 4 REFS  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*nuclear facilities; \*foundations; stability  
 ; response; soil mechanics; loading; computer programs;  
 finite element analysis; statistical methods; SHOCK; LUSH;  
 design; spectral analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894562 78-28039  
**Statistic assessment of strong earthquake intensities variation in urban areas**  
 Stojkovic, M.  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 932p., 1977  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Descriptors: earthquakes; intensity; urban areas; soil  
 mechanics; buildings; statistical analysis; isoseismal  
 lines  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894552 78-27944  
**A macrozoning map of Japan on amplification characteristic of 1-10 sec strong ground motions**  
 Ohta, Y.; Kigami, H.; Okada, S.  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 919p., 1977  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Latitude: N300000 Longitude: E1470000  
 Descriptors: \*Japan; engineering geology; earthquakes;  
 Asia; amplitude; strong motion; ground motion; structures;  
 1961-1976; seismic risk; alluvium; clastic sediments;  
 statistical analysis; zoning; maps  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894600 78-27786  
**Evaluation of methods for earthquake analysis of structure-soil interaction**  
 Gutierrez, J. A.; Chopra, A. K.  
 Univ. Calif., Dep. Civ. Eng., Berkeley, Calif., USA  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 1449-1454p., 1977  
 11 REFS.

894541 78-28036

**Seismotectonic study of Northwest Kashmir**

Srivastava, V. K.; Chouhan, R. K. S.; Singh, J.  
Sixth world conference on earthquake engineering. New  
Delhi, India. Jan. 10-14, 1977  
World Conf. Earthquake Eng. Proc. 6. 903-904p. 1977  
Subfile: B

Country of Publ.: International  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Latitude: N327000; N370000 Longitude: E0801500; E0723000  
Descriptors: India; engineering geology; tectonophysics  
; earthquakes; plate tectonics; Asia; Jammu and Kashmir;  
seismicity; epicenters; focus; mechanism; probability;  
seismic risk; seismotectonics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894528 78-27922

**An approach to establishing design surface displacements for  
active faults**

Mail, K. Cluff, L. S.  
Woodward-Clyde Consult., San Francisco, Calif., USA  
Sixth world conference on earthquake engineering. New  
Delhi, India. Jan 10-14, 1977  
World Conf. Earthquake Eng. Proc. 6. 811-816p. 1977  
7 REFS.

Subfile B  
Country of Publ.: International  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Descriptors: earthquakes; effects; displacements;  
active faults; faults; probability; seismic risk;  
structures; engineering geology; Bayesian analysis;  
statistical analysis; dislocations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894527 78-27881

**Statistical seismicity of Taiwan**

Lou, V. S.; Chu, B. P. H.  
Converse Davis Dixon Assoc., Pasadena, Calif., USA  
Sixth world conference on earthquake engineering. New  
Delhi, India. Jan 10-14, 1977  
World Conf. Earthquake Eng. Proc. 6. 806-810p. 1977  
Subfile B

Country of Publ.: International  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English  
illus. table

Latitude: N220000; N253000 Longitude: E1230000; E1200000  
Descriptors: Taiwan; engineering geology; earthquakes;  
Asia; seismicity; statistical analysis; 1920-1974; site  
exploration; attenuation; acceleration; probability;  
velocity  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894524 78-27662

**Seismic risk analysis of Indian Peninsula**

Basu, S.; Nigam, N. C.  
Sixth world conference on earthquake engineering. New  
Delhi, India. Jan. 10-14, 1977  
World Conf. Earthquake Eng. Proc. 6. 782-790p. 1977  
9 REFS.

Subfile: B  
Country of Publ.: International  
Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English  
Note: With discussion. illus., sketch maps  
Latitude: N060000; N400000 Longitude: E0980000; E0660000  
Descriptors: India; engineering geology; earthquakes;  
Asia; seismic risk; statistical analysis; acceleration;  
velocity; ground motion; probability  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894523 78-27637

**Seismic risk and seismic zoning of the Caracas Valley**  
 Alonso, J. L.; Larotta, J.  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 776-782p., 1977  
 4 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC

Languages: English  
 illus.: sketch maps  
 Latitude: N103500; N103500 Longitude: W0665600; W0665600  
 Descriptors: \*Venezuela; Caracas; seismic risk;  
 earthquakes; South America; acceleration; Poisson's ratio;  
 microzoning; ground motion; probability; statistical analysis;  
 elastic constants; seismicity; zoning  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894522 78-28008

**A seismic risk contour map for Nicaragua**  
 Shah, H. C.; Zsutty, T. C.; Montgat, C. P.; Kiremidjian, A.  
 S.; Padilla, L.; Kranwinkler, H.  
 Stanford Univ., Dep. Civ. Eng., Stanford, Calif., USA  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 770-775p., 1977  
 3 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC

Languages: English  
 illus.: tables, sketch map  
 Latitude: N105000; N105000 Longitude: W0822000; W0874500  
 Descriptors: \*Nicaragua; engineering geology;  
 earthquakes; Central America; seismic risk; isoseismal  
 lines; probability; Poisson's ratio; elastic constants;  
 mathematical models; models; statistical analysis;  
 acceleration; attenuation; seismic sources  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894518 78-28093

**Seismic design regionalization maps for the United States**  
 Whitman, R. V.; Donovan, N. C.; Bolt, B. A.; Algermissen, S.  
 I.; Sharpe, R. L.  
 Mass. Inst. Technol., Dep. Civ. Eng., Cambridge, Mass., USA;  
 Dames & Moore, USA  
 Sixth world conference on earthquake engineering. New

Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 742-749p., 1977  
 Subfile B

Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Note: With discussion, sketch maps  
 Latitude: N180000; N1720000 Longitude: W0670000; E1700000  
 Descriptors: \*United States; engineering geology;  
 earthquakes; seismic risk; ground motion; statistical  
 analysis; probability  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894501 78-27749

**Probabilistic assessment of seismic risk on local soil  
 sediments**  
 Faccioli, E.  
 Sixth world conference on earthquake engineering. New  
 Delhi, India, Jan. 10-14, 1977  
 World Conf. Earthquake Eng., Proc. 6, 584-591p., 1977  
 7 REFS.

Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Note: With discussion, illus.  
 Descriptors: \*Soil mechanics; applications; seismic risk;  
 earthquakes; soil dynamics; statistical analysis;  
 probability; amplitude; Mexico City; clay; elastic  
 sediments; velocity; acceleration  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

891500 78 28115  
 Latitude: N483000; N500000 Longitude: E0120000; E0103000  
 Descriptors: West Germany; soil mechanics; engineering  
 geology; deformation; slope stability; clays; Germany;  
 Europe; Bavaria; Franconian Jurs.; slope stability; stress  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**A probabilistic approach to estimate design earthquake for a site in terms of magnitude, epicentral distance and return period**  
 Yoshikawa, S.; Iwasaki, Y.; Ishii, E  
 Sixth world conference on earthquake engineering. New Delhi, India, Jan 10-14, 1977  
 World Conf Earthquake Eng Proc. 6. 575-583p. 1977  
 9 REFS.

Subfile B  
 Country of Publ: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: With discussion. illus. sketch maps  
 Latitude: N300000; N450000 Longitude: E1470000; E1290000  
 Descriptors: Japan; engineering geology; earthquakes; Asia; Osaka; epicenters; statistical analysis; magnitude; intensity; seismic risk  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

894210 78 27984  
**Classification of earthquake prediction information for Hirokake, Y**  
 Tritonophysics 46 1-2. 175-185p. 1978  
 CODEN ICTOAM 9 REFS  
 Subfile B  
 Country of Publ: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.; tables  
 Descriptors: geologic hazards; earthquakes; seismology; prediction; precursors; engineering geology; environmental geology; statistical analysis; magnitude; classification; time windows  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

892933 78 24067  
**Statistische Untersuchung der Hangformen im Opalinuston der Franckischen Alb**  
**Statistical analysis of slope forms in the Al(i) clay of the Franconian Alb**  
 Tschierke, N  
 Rock Mech (Vienna) 10 3. 113-123p. 1978  
 CODEN RMPWAS 9 REFS.  
 Subfile B  
 Country of Publ: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: English  
 illus.; tables

892232 78-23990  
**Determination of wave-induced pressures in the soil media contiguous to a buried pipeline**  
 Lai, N. W.; Dominguez, R. F.  
 Tex. A&M Univ., Dep. Civ. Eng., College Station, Tex., USA  
 Third international conference on port and ocean engineering under arctic conditions, Fairbanks, Alaska, United States, Aug 11-15, 1975  
 Int. Conf. Port Ocean Eng. Arct. Cond., Proc. 3, Vol. 2. 1059-1069p. 1975  
 8 REFS.

Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: engineering geology; foundations; site exploration; stability; pipelines; soil mechanics; offshore environment; models; mathematical models; finite element analysis; statistical methods; theoretical studies; failure; erosion; liquefaction  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

891785 78-23164

**The influence of system stiffness and test mode on phenomena accompanying stick-slip on fault surfaces**

Goodman, R. E.; Sundaram, P. N.  
Univ. Calif. Berkeley, Dep. Civ. Eng., Berkeley, Calif., USA

**Proceedings of Conference II: experimental studies of rock friction with application to earthquake prediction**

Byerlee, J. (organizer); Brace, W. F. (organizer); Evernden, J. F. (EDITOR)

Conference II: experimental studies of rock friction with application to earthquake prediction, Stanford, Calif., United States, April 28-30, 1977

Publ. U. S. Geol. Surv., Off. Earthquake Stud. 147-188p., 1977  
22 REFS.

Subfile: B  
Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Languages: English  
Note: With discussion by Logan, J. M., illus., tables

Descriptors: faults; deformation; rock mechanics; seismology; mechanics; experimental studies; materials; properties; seismic sources; stick-slip; loading; elastic limit; shear stress; models; finite element analysis; statistical methods; stress; distribution; materials; properties

Section Headings: 16 (STRUCTURAL GEOLOGY)

890969 78-23125

**Analysis of fracture orientations for input to structural models of discontinuous rock**

Mahab, M. A.; Bolstad, D. D.; Alldredge, J. R.; Shanley, R. J.

U. S. Bur. Mines, Denver Min. Res. Cent., Denver, Colo., USA  
U. S. Bur. Mines, Rep. Invest. 7669, 76p., 1972

CODEN XBMIA6 10 REFS  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC

Languages: English  
illus., tables

Descriptors: structural analysis; rock mechanics; automatic data processing; fractures; materials; properties; structural geology; orientation; materials; properties; models; mathematical models; cluster analysis; statistical methods; computer programs; sediments; till; clastic sediments; pebbles; coal; organic residues; porphyry copper; Poisson's ratio; elastic constants

Section Headings: 16 (STRUCTURAL GEOLOGY)

890963 78-23850

**A method for the prediction of stresses in an isotropic inclusion or orebody of irregular shape**

Oudenhoven, M. S.; Babcock, C. D.; Blake, W.

U. S. Bur. Mines, Denver Min. Res. Cent., Denver, Colo., USA  
U. S. Bur. Mines, Rep. Invest. 7645, 36p., 1972

CODEN XBMIA6 4 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC

Languages: English  
illus., tables

Descriptors: rock mechanics; materials; properties; stress; materials; properties; isotropic materials; inclusions; ore bodies; elasticity; finite element analysis; statistical methods; loading; Young's modulus; elastic constants; models; strain

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

890937 78-23873

**Technique of measuring initial deformation around an opening: analysis of two raise-bore tests**

Waddell, G. G.; Crocker, T. J.; Skinner, E. H.

U. S. Bur. Mines, Spokane Min. Res. Lab., Spokane, Wash., USA

U. S. Bur. Mines, Rep. Invest. 7505, 60p., 1971  
CODEN XBMIA6 17 REFS.

Subfile: B  
Country of Publ.: United States

Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English

illus., tables  
Latitude: N473000; N480000 Longitude: W1161500; W1170500

Descriptors: underground installations; rock mechanics; faults; mines; elasticity; engineering geology; deformation; Kootenai County; in situ; experimental studies

finite element analysis; statistical methods; excavations; stress; United States; Coeur d'Alene; Lucky Friday Mine; Millan; faults; strike-slip faults; metasedimentary rocks; Precambrian; field studies

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

890070 78-23832  
Colorado Univ., USA  
**Determining seepage characteristics of mill-tailings dams by the finite-element method**  
Knealy, C. D.; Busch, R. A  
U. S. Bur. Mines, Spokane Min. Res. Lab., Spokane, Wash., USA  
CODEN XBMIA6  
U. S. Bur. Mines, Rep. Invest. 7477, 113p., 1971  
Subfile B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus.: tables  
Descriptors: dams; soil mechanics; automatic data processing; design; materials; properties; engineering geology; embankments; permeability; seepage; finite element analysis; statistical methods; computer programs; models; mathematical models; hydraulics; materials.  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

890922 78-23827  
**A method for estimating strength of rock containing planes of weakness**  
Hickman, F. G.; Etlickson, M. L.  
U. S. Bur. Mines, Denver Min. Res. Cent., Denver, Colo., USA  
U. S. Bur. Mines, Rep. Invest. 7449, 29p., 1970  
CODEN XBMIA6 12 REFS.  
Subfile B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus.: tables

Descriptors: rock mechanics; slope stability; failure; shear strength; experimental studies; loading; uniaxial tests; triaxial tests; open-pit mining; limestone; carbonate rocks; sandstone; elastic rocks; gneiss; gneisses; data analysis; stress; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

890583 78-23982  
**Erfahrungen mit mathematisch-geologischen Verfahren bei regionalen ingenieurgeologischen Arbeiten**  
Experiences with mathematical-geological methods in engineering-geological works  
Kannel, H.; Rey, F.  
Zingenhardt, W.  
Z. Angew. Geol. 1 22, 37-42p., 1976  
CODEN ZANGAK  
Subfile B

Country of Publ.: German Democratic Republic  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: German Summary Languages: Russian  
illus.: table, sketch map  
Latitude: N512500; N522500 Longitude: E0120000; E0115600  
Descriptors: East Germany; mathematical geology; engineering geology; methods; rock mechanics; classification; Halle; Germany; Europe; statistical analysis; linear regression analysis; variance analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

890077 78-17609  
**Elastic-plastic stability analysis of mine-waste embankments**  
Corp. E. L.; Schuster, R. L.; McDonald, M. M.  
U. S. Bur. Mines, Spokane Mining Res. Cent., Spokane, Wash., USA  
U. S. Bur. Mines, Rep. Invest. 8069, 98p., 1975  
CODEN XBMIA6 124 REFS.  
Subfile B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus.: tables, sketch maps

Descriptors: West Virginia; soil mechanics; slope stability; automatic data processing; engineering geology; elasticity; embankments; failure; industrial waste; mines; plasticity; seepage; stress; finite element analysis; statistical methods; engineering properties; permeability; grain size; shear strength; poisson's ratio; elastic constants; United States; Buffalo Creek Valley; Middle Fork Valley; Saunders  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

W. Va., USA  
U. S. Bur. Mines, Rep. Invest. 7813, 22p., 1973  
CODEN: XBMIAG 24 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus., tables  
Descriptors: rock mechanics; failure; hydraulic fracturing; reservoir rocks; sandstone; elastic rocks; petroleum; experimental studies; materials; properties; permeability; strength; dynamics; elasticity; stress; saturation; pressure; orientation; loading; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

890016 78-17662  
Computer program for pit slope stability analysis by the finite element stress analysis and limiting equilibrium method  
Wang, F. D.; Sun, M. C.; Ropchan, D. M.  
U. S. Bur. Mines, Denver Min. Res. Cent., Denver, Colo., USA  
U. S. Bur. Mines, Rep. Invest. 7685, 53p., 1972  
CODEN: XBMIAG 9 REFS.  
Subfile: P  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus., tables  
Descriptors: slope stability; soil mechanics; automatic data processing; failure; materials; properties; engineering geology; circular failure; shear strength; finite element analysis; statistical methods; stabilization; equilibrium; stress; plane failure; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

890069 78-17645  
In situ determination of rock behavior by overcore stress relief method, physical property measurements, and initial deformation method  
Skinner, E. H.; Waddell, G. G.; Conway, J. P.  
U. S. Bur. Mines, Spokane Min. Res. Cent., Spokane, Wash., USA  
U. S. Bur. Mines, Rep. Invest. 7962, 87p., 1974  
CODEN: XBMIAG 56 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus., tables, sketch map  
Latitude: N473000 Longitude: W1160000; W1164500  
Descriptors: Idaho; rock mechanics; engineering geology; field studies; Kootenai County; materials; properties; United States; Coeur d'Alene; materials; properties; physical properties; stress; deformation; failure; in situ; measurement; statistical analysis; temperature; heat flow; experimental studies; models; strain; biaxial tests; dynamics; elasticity; density; Poisson's ratio; elastic constants  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

890078 78-17651  
Statistical comparison of the pulse and resonance methods for determining elastic moduli  
Thill, R. E.; Peng, S. S.  
U. S. Bur. Mines, Twin Cities Min. Res. Cent., Minneapolis, Minn., USA  
U. S. Bur. Mines, Rep. Invest. 7831, 24p., 1974  
CODEN: XBMIAG 50 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus., tables  
Descriptors: rock mechanics; elasticity; Saint Cloud Gray Granodiorite; Tennessee Marble; Young's modulus; stress; moisture; statistical analysis; pulse methods; resonance methods; elastic constants; shear; Poisson's ratio; granodiorite; granite; granodiorite family; marble; marbles; ultrasonic methods; velocity  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

890034 78-17621  
Analysis of factors influencing fracture initiation and orientation in oil reservoir sandstone  
Kumar, G. A.; Frohne, K. H.  
U. S. Bur. Mines, Morgantown Energy Res. Cent., Morgantown, W. Va., USA  
U. S. Bur. Mines, Rep. Invest. 7813, 22p., 1973  
CODEN: XBMIAG 24 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus., tables  
Descriptors: rock mechanics; failure; hydraulic fracturing; reservoir rocks; sandstone; elastic rocks; petroleum; experimental studies; materials; properties; permeability; strength; dynamics; elasticity; stress; saturation; pressure; orientation; loading; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

889575 78-17010

**Possible interaction between thin-skinned and basement tectonics in the Appalachian Basin and its bearing on exploration for fractured reservoirs in the Devonian shale**  
Dean, C. S.; Overbey, W. K., Jr  
Dep. Energy, Morgantown Energy Res. Cent., Morgantown, W. Va., USA

The Geological Society of America, Southeastern Section, 27th annual meeting, Chattanooga, Tenn., United States, April 6-7, 1978  
Geol. Soc. Am. Abstr. Programs 10 4, 166p., 1978  
CODEN GAAPRC  
Subtitle B  
Country of Publ.: United States  
Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC

Languages: English  
Descriptors: Appalachians; rock mechanics; natural gas; structural geology; applications; exploration; tectonics; reservoir rocks; Appalachian Basin; North America; basement; thickness; shale; clastic rocks; Devonian; Paleozoic; permeability; fractures; stress; pore pressure; tensile strength; compressive strength; joints; evolution; thin-skinned tectonics; finite element analysis; structural methods; reconstruction  
Section Headings: 16 (STRUCTURAL GEOLOGY)

889047 78-17687

**Finite element analysis and design of chemically stabilized tunnels**  
Tan, D. Y.  
Stanford Univ., Stanford, Calif., USA  
219p., 1977  
Subtitle B  
Degree Level Doctoral  
Country of Publ.: United States  
Doc Type THESIS Bibliographic Level MONOGRAPHIC

Languages: English  
Diss Abstr. Int., Vol. 38, No. 9, p. 4377R-4378B, 1978.  
Descriptors: tunnels; automatic data processing; soil mechanics; stability; engineering geology; deformation; grouting; creep; stabilization; design; finite element analysis; statistical methods; land subsidence; case studies; theoretical studies; subways  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

888816 78-17611

**Contribution a l'etude du complexe barrage-fondation et application des seismes dus au remplissage de certains reservoirs**  
The dam-foundation complex and an explanation of earthquakes

**due to the filling of certain reservoirs**

Duab, B.  
Liege, Univ., Cent. Etud., Rech. Essais Sci. Geol. Civ., Mem. 46, 75p., 1974  
CODEN MFCEBF 30 REFS.  
Subtitle B

Country of Publ.: Belgium  
Doc Type SERIAL Bibliographic Level MONOGRAPHIC  
Languages: French Summary Languages Dutch  
Title:

Descriptors: dams; foundations; earthquakes; automatic data processing; reservoirs; causes; engineering geology; gravity dams; experimental studies; seismology; flow regime; finite element analysis; statistical methods; infiltration; ground water; pore pressure; rock mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

897779 78-17740

**The dynamic response of gravity platforms**

Bungar, R.; Eldred, P. J.  
Earthquake Eng. Struct. Dyn. 6 2, 123-139, 1978  
CODEN JUEFFG 20 REFS  
Subtitle B

Country of Publ.: International  
Doc Type SERIAL Bibliographic Level ANALYTIC  
Languages: English  
Title: tables

Descriptors: marine installations; foundations; engineering geology; theoretical studies; petroleum engineering; gravity platforms; response; finite element analysis; statistical methods; models; North Sea; Atlantic Ocean; soil mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

887653 78-17503  
**Bayesian decision analysis of a statistical rainfall/runoff relation**  
 Gray, H. A.  
 Ariz. Univ. Dep. Hydrol. Water Resour. Tech. Rep. 14.  
 67p. 1972  
 CODEN AHWTAE  
 Subfile B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Titles: Tables  
 Latitude: N322000 Longitude: W1110000; W1110000  
 Descriptors: \*Arizona; \*hydrology; \*engineering geology; surveys; highways; atmospheric precipitation; rain; runoff; statistical methods; United States; Rillito Creek; Tucson; design; bridges; mathematical geology; hydrogeology; site exploration  
 Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

886955 78-20791  
**Komplexe Bearbeitung ingenieurgeologischer Daten mit Klassifizierungs- und Erkennungsverfahren**  
**Complex treatment of engineering-geological data by means of classification and identification methods**  
 Harff, J.; Sponholz, G.  
 Z. Angew. Geol. 21: 8 372-376p. 1975  
 CODEN ZANGAK 4 REFS.  
 Subfile B  
 Country of Publ.: German Democratic Republic  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: Russian  
 Titles: Tables  
 Latitude: N540600 Longitude: E0120900; E0120900  
 Descriptors: \*automatic data processing; \*soil mechanics; \*East Germany; \*engineering geology; materials; properties; classification; Rostock; Germany; Europe; cluster analysis; statistical methods; cohesive materials; GREIF 3; sediments; materials, Properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

887538 78-17696  
**Statistical zonation as an aid to geotechnical evaluation of oceanic sediments**  
 Andrews, D. E.; Cubitt, J. M.  
 Syracuse Univ. Dep. Geol., Syracuse, N.Y., USA  
 The Geological Society of America, Northeastern Section, 13th annual meeting, Boston, Mass., United States, March 9-11, 1978  
 Geol. Soc. Am. Abstr. Programs 10: 2, 30p. 1978  
 CODEN GAJFBC  
 Subfile R  
 Country of Publ.: United States  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*sediments; \*Atlantic Ocean; \*soil mechanics; properties; engineering geology; experimental studies; engineering properties; North Atlantic; cores; multivariate analysis; maps; statistical methods; zoning  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

887245 78-20695  
**The development and application of a finite element program for the solution of geotechnical problems**  
 Rodrigues, J. S. N.  
 Univ. of Surrey, Guildford, GBR  
 unknown. 1975  
 Subfile C  
 Degree Level: Doctoral  
 Country of Publ.: United Kingdom  
 Doc Type: THESES Bibliographic Level: MONOGRAPHIC

880326 78-20657

**Slope stability analysis by the finite element stress analysis and limiting equilibrium method**

Wang, F. D.; Sun, M. C.  
U. S. Bur. Mines, Denver Min. Res. Cent., Denver, Colo., USA  
U. S. Bur. Mines, Rep. Invest. 7341, 16p., 1970  
CODEN: ADMIAG 15 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus., tables  
Descriptors: slope stability; soil mechanics; failure; elasticity; finite element analysis; stress; strain; statistical methods; equilibrium; shear strength; materials; properties; open-pit mining; stabilization; Poisson's ratio; elastic constants  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

885695 78-21010

**Morphometric analysis of dolines for predicting ground subsidence, Monroe County, West Virginia**

Ogden, A. E.; Reger, J. P.  
W. Va. Univ., Dep. Geol., Morgantown, W. Va., USA

Hydrologic problems in karst regions  
Dilamater, R. R. (EDITOR); Csallany, S. C. (EDITOR)  
International symposium on hydrologic problems in karst regions, Bowling Green, Ky., United States, April 26-29, 1976  
Publ.: West, Ky. Univ.  
130-139p., 1977  
8 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, strat. col., sketch maps  
Latitude: N372300; Longitude: W0801500; W0805000  
Descriptors: West Virginia; geomorphology; solution features; engineering geology; land subsidence; dolines; Monroe County; United States; karst; prediction; Greenbrier; Limestone; carbonate rocks; limestone; lineaments; statistical analysis  
Section Headings: 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

884587 78-20682

**Analysis of soil deformation by elastic-plastic work-hardening model**

Iisu, J. R.

Ohio State Univ., Columbus, Ohio, USA  
201p., 1977  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss Abstr. Int., Vol. 38, No. 8, p. 3796B, 1978.  
Descriptors: soil mechanics; deformation; experimental studies; stress; strain; finite element analysis; statistical methods; triaxial tests; compression; elasticity; plasticity; theoretical studies; embankments; highways  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

883402 78-14258

**Study of the relations between subsidence, drawdown, and lithology in the Houston-Galveston area**

Valente, J. T.  
Univ. Texas, Austin, Texas, USA  
1976  
Subfile: B  
Degree Level: Master's  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Latitude: N290000; Longitude: W941500; W0960000  
Descriptors: Texas; automatic data processing; soil mechanics; engineering geology; materials; properties; Harris County; Galveston County; land subsidence; clays; United States; drawdown; sand; clastic sediments; compressibility; compaction; statistical analysis; models; materials; properties; Houston; Galveston; Gulf Coastal Plain; North America  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

2895. illus.  
 Descriptors: mathematical geology; engineering geology; methods; techniques; finite element analysis; mathematical methods; statistical methods; hourglass patterns; stress; strain; deformation; two-dimensional models; three dimensional models; theoretical studies; isotropic materials; elastic materials; matrices; Young's modulus; elastic constants; Poisson's ratio; beams; structural mechanics; rigidity  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

881820 78-14270  
**Associated and non-associated constitutive relations for undrained behaviour of isotropic soft clays**  
 Banerjee, P. K.; Stipho, A. S.  
 Int. J. Numer. Anal. Methods Geomech. 2: 1, 35-56p., 1978  
 ISSN: 0363-9061 20 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: table

881998 78-14433  
**Prognoz prosadochnosti lessovykh porod Priangar'ya Predicting the substance of loess in the Angara region**  
 Ryashchenko, T. G.; Vasil'yeva, E. N.  
 Sov. Geol. 8: 126-133p., 1976  
 CUDEN: SVGLA2 7 REFS.  
 Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Russian  
 illus.: tables  
 Latitude: N523000 Longitude: E1040000; E1000000  
 Descriptors: \*USSR; \*engineering geology; \*sediments; materials; properties; clastic sediments; loess; materials; properties; Angara; Ust'-Ilim; Siberia; chemical composition; statistical analysis; Boguchan  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

881821 78-14365  
**Treatment of hourglass patterns in low order finite element codes**  
 Kneiff, D.; Frazier, G. A.  
 Calif. Inst. Technol., Seismol. Lab., Pasadena, Calif., USA; Univ. Calif., San Diego  
 Int. J. Numer. Anal. Methods Geomech. 2: 1, 57-72p., 1978  
 ISSN: 0363-9061 8 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Calif. Inst. Technol., Div. Geol. Planet. Sci., Contrib. No.

882062 78-14288  
**Computer-based data bank and statistical analysis of slope instability phenomena**  
 Carrara, A.; Carratelli, F. P.; Merenda, L.  
 Z. Geomorphol. 21: 2, 187-222p., 1977  
 CODEN: ZGMPAG 58 REFS.  
 Subfile: B  
 Country of Publ.: Germany, Federal Republic of  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: German  
 illus.: charts, tables, geol. sketch map  
 Latitude: N380000 Longitude: E0170000; E0154500  
 Descriptors: Italy; \*automatic data processing; \*geomorphology; engineering geology; mass movements; slope stability; landslides; Europe; Calabria; Crati Basin; erosion; information systems; statistical analysis; quantitative geomorphology; causes; controls  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

2895. illus.  
 Descriptors: mathematical geology; engineering geology; methods; techniques; finite element analysis; mathematical methods; statistical methods; hourglass patterns; stress; strain; deformation; two-dimensional models; three dimensional models; theoretical studies; isotropic materials; elastic materials; matrices; Young's modulus; elastic constants; Poisson's ratio; beams; structural mechanics; rigidity  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

881820 78-14270  
**Associated and non-associated constitutive relations for undrained behaviour of isotropic soft clays**  
 Banerjee, P. K.; Stipho, A. S.  
 Int. J. Numer. Anal. Methods Geomech. 2: 1, 35-56p., 1978  
 ISSN: 0363-9061 20 REFS.  
 Subfile: B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: table

881819 78-14299  
**A mathematical model for predicting coupled heat and water movement in unsaturated soil**  
 Dempsey, B. J.  
 Univ. Ill Urbana-Champaign, Dep Civ Eng, Urbana, Ill, USA

Int J Numer Anal Methods Geomech 2 1, 19 31p, 1978  
 ISSN 0363-9061 34 REFS  
 Subfile B  
 Country of Publ: International  
 Doc Type SERIAL Bibliographic Level ANALYTIC  
 Languages: English  
 illus: tables  
 Descriptors: \*soil mechanics; \*foundations; materials; properties; settlement; moisture, mathematical models; models; movement; water; heat transfer, unsaturated materials; finite element analysis; statistical methods production; water table; atmospheric precipitation; fluid mechanics; Darcy's law; computer programs; hydrologic cycle; examples; Labeland Sand; Illinois; upper Pleistocene; Pleistocene; Quaternary; till; clastic sediments; applications; pavement; materials; properties  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

881818 78-14388  
**A three-dimensional deformation analysis of the Storvass Dam**  
 Martin, H. C.  
 Ohio State Univ., Dep Civ. Eng., Columbus, Ohio, USA  
 Int J Numer Anal Methods Geomech 2 1, 3 17p, 1978  
 ISSN 0363 9061 5 REFS  
 Subfile B  
 Country of Publ: International  
 Doc Type SERIAL Bibliographic Level ANALYTIC  
 Languages: English  
 illus: sects  
 Descriptors: \*dams; rock mechanics; foundations; deformation; rockfill dams; Storvass Dam; three-dimensional models; models; computer programs; finite element analysis; statistical methods; stress; strain; triangular tests; KVASOL; matrices; Young's modulus; elastic constants; Poisson's ratio; elastic media; isotropic media; materials; properties; displacements  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

881656 78-14302  
**Finite element analysis of buried flexible metal culvert structures**  
 Duncan, J M

Laurits Bjerrum memorial volume; contribution to soil mechanics  
 Jøssv, N (EDITOR); Jøssv, J (EDITOR); Kjøvne, L. R (EDITOR)  
 Pub: Norw. Geotech. Inst., 213 222p, 1976  
 34 REFS.  
 Subfile B  
 Country of Publ: Norway  
 Doc Type BOOK Bibliographic Level ANALYTIC  
 Languages: English  
 illus: plates, table  
 Descriptors: \*highways; materials; properties; culverts; finite element analysis; statistical methods; engineering; geology; shape; soil mechanics; stress; deformation; mathematical methods; California; United States; field studies  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

881575 78-14252  
**Engineering geology of the northern portion of the Illinois shore of Lake Michigan**  
 Perry, A O.  
 Purdue Univ., West Lafayette, Indiana, USA  
 166p, 1977  
 Subfile B  
 Degree Level Doctoral  
 Country of Publ: United States  
 Doc Type THESIS Bibliographic Level MONOGRAPHIC  
 Languages: English  
 Diss: Abstr. Int., vol. 38, No. 7, p. 3037B, 1978.  
 Latitude: N413000; N423000 Longitude: W0873500; W0880000  
 Descriptors: \*Great Lakes; engineering geology; Cook County; Lake County; shorelines; North America; Lake Michigan; Illinois; United States; bluffs; till; clastic sediments; failure; erosion; statistical analysis; management; construction; stabilization  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

expansive materials  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

879047 78-10754

**La estabilidad a corto plazo de excavaciones a cielo abierto en la arcilla de la Ciudad de Mexico--The short-term stability of open excavations in Mexico City clay**  
Resendiz, D.; Zonana, J.

Nabor Carrillo; el hundimiento de la Ciudad de Mexico y Proyecto Texcoco; contribucion de Proyecto Texcoco al VII congreso internacional de mecanica de suelos e ingenieria de cimentaciones--Nabor Carrillo; the subsidence of Mexico City and Texcoco Project; contribution of Texcoco Project to the VII international conference on soil mechanics and foundation engineering  
Betea, M. R. (chairperson)  
Publ: Secr. de Hacienda y Credito Publico  
203-227p... 1969  
12 REFS.

Subfile: B  
Country of Publ.: Mexico  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: Spanish  
illus.: tables  
Latitude: N192500; Longitude: W0991000  
Descriptors: \*Mexico; engineering geology; slope stability; North America; Mexico City; soil mechanics; clays; excavations; plasticity; compression; failure; strain; finite element analysis; statistical methods; ground water; levels; loading  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

881508 78-14327

**A substructure method for earthquake analysis of structures including structure-soil interaction**  
Gutierrez, J. A.; Chopra, A. K.  
Univ. Calif., Dep. Civ. Eng., Berkeley, Calif., USA  
Earthquake Eng. Struct. Dyn. 6: 1, 51-69p., 1978  
CODEN: IJEEBG 27 REFS.

Subfile B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*foundations; \*soil mechanics; structures; materials; properties; failure; theoretical studies; ground motion; earthquakes; response; half-space; vibration; mathematical methods; stability; finite element analysis; statistical methods; Fourier analysis; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

880192 78-10798

**Probability-based short term design of soil slopes**  
Ting, W. H.; Yuceman, M. S.; Ang, A. H. S.  
Can. Geotech. J. 13: 3, 201-215p., 1976  
CODEN: CGJDAH 33 REFS.

Subfile B  
Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.: tables  
Descriptors: \*slope stability; \*soil mechanics; embankments; materials; properties; strength; materials; properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

879967 78-10430

**Theoretical transient behaviour of saturated and unsaturated soils under load and changing moisture conditions**  
Richards, B. G.  
Aust. CSIRO, Div. Appl. Geomech., Tech. Pap. 16, 23p., 1973  
CODEN: AAGTCN 40 REFS.

Subfile B  
Country of Publ.: Australia  
Doc Type: SERIAL Bibliographic Level: MONOGRAPHIC  
Languages: English  
illus.  
Descriptors: \*soil mechanics; materials; properties; consolidation; materials; properties; saturation; loading; moisture; theoretical studies; mathematical models; models; finite element analysis; statistical methods; clays;

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

878928 78-10467  
**Finite element analysis of time dependent deformations and pore pressures in excavations and embankments**  
 Orami, A. E.  
 Stanford Univ., Stanford, Calif., USA  
 259p. 1977  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 38, No. 6, p. 2781B-2782B, 1977.  
 Descriptors: automatic data processing; soil mechanics; engineering geology; deformation; simulation; time; pore pressure; excavations; embankments; finite element analysis; statistical methods; theoretical studies; mathematical models; models; consolidation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

878819 79-10583  
**A rational analysis of shallow foundations considering soil-structure interaction**  
 Fanger, R. A.; Hurdle, I. J.  
 Aust. Geomech. J. 5:1, 20-25p., 1975  
 CIBEN AUGURU 33 REFS.  
 Subfile: B  
 Country of Publ.: Australia  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: foundations; structures; design; soil mechanics; anisotropy; elasticity; finite element analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

878815 78-10519  
**Development of a numerical model for discontinua**  
 Purman, R. C.  
 Coffey & Hollingworth Pty., Brisbane, AUS  
 Aust. Geomech. J. 4:1, 13-22p., 1974  
 CIBEN AUGURU 34 REFS.  
 Subfile: B  
 Country of Publ.: Australia  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: rock mechanics; materials; properties; joints; materials; properties; discontinua; fractures; mathematical models; models; finite element analysis; statistical methods; simulation; displacements; failure; strain

878169 78-10455  
**Discrete fracture propagation in rock; laboratory tests and finite element analysis**  
 Ingraffea, A. R.  
 Univ. of Colorado, Boulder, Colo., USA  
 374p., 1977  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 38, No. 5, p. 2293B-2294B, 1977.  
 Descriptors: rock mechanics; deformation; Indiana Limestone; fractures; experimental studies; laboratory studies; theoretical studies; mathematical models; models; finite element analysis; statistical methods; propagation; cracks; loading; limestone; carbonate rocks; granodiorite; granite-granodiorite family  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

878134 78-10303  
**Multivariate analysis of petrographic and chemical properties influencing porosity and permeability in selected carbonate aquifers in central Pennsylvania**  
 Brown, C. E.  
 Pennsylvania State Univ., University Park, Pa., USA  
 220p., 1977  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 38, No. 5, p. 2083B-2084B, 1977.  
 Latitude: N404000 Longitude: W0771000; W0783500  
 Descriptors: Pennsylvania; ground water; sedimentary rocks; engineering geology; hydrogeology; surveys; carbonate rocks; properties; materials; Beckmantown Group; Stonehenge Limestone; Nittany Dolomite; Axemahn Limestone; Bellefonte Dolomite; Centre County; United States; Central; Centre County; aquifers; aquifer properties; multivariate analysis; statistical analysis; porosity; permeability; chemical properties; petrography; Ordovician; Paleozoic; Lower Ordovician; materials; properties  
 Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

878134 78-10303  
**Multivariate analysis of petrographic and chemical properties influencing porosity and permeability in selected carbonate aquifers in central Pennsylvania**  
 Brown, C. E.  
 Pennsylvania State Univ., University Park, Pa., USA  
 220p., 1977  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 38, No. 5, p. 2083B-2084B, 1977.  
 Latitude: N404000 Longitude: W0771000; W0783500  
 Descriptors: Pennsylvania; ground water; sedimentary rocks; engineering geology; hydrogeology; surveys; carbonate rocks; properties; materials; Beckmantown Group; Stonehenge Limestone; Nittany Dolomite; Axemahn Limestone; Bellefonte Dolomite; Centre County; United States; Central; Centre County; aquifers; aquifer properties; multivariate analysis; statistical analysis; porosity; permeability; chemical properties; petrography; Ordovician; Paleozoic; Lower Ordovician; materials; properties  
 Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

878028 78-10595  
**Interaction between two parallel tunnels**  
 Ghahoussi, J.; Ranken, R. E.  
 Univ. Ill., Urbana-Champaign, Dep. Civ. Eng., Urbana, Ill., USA  
 Int. J. Numer. Anal. Methods Geomech. 1: 1, 75-103p., 1977  
 ISSN: 0363-9061 14 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*soil mechanics; \*nuclear facilities; \*foundations; \*application; structures; seismic risk; boundaries; ground motion; strain; one-dimensional models; models; finite element analysis; statistical methods; shear strength; techniques  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

877780 78-10507  
**Methods for the numerical solution of the equations of viscoelasticity**  
 Becker, J. R.; Small, J. C.  
 Int. J. Numer. Anal. Methods Geomech. 1: 2, 139-150p., 1977  
 ISSN: 0363-9061 13 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table  
 Descriptors: \*engineering geology; \*construction materials; \*foundations; materials; properties; creep; loading; viscous properties; materials; properties; creep; loading; viscous materials; elastic materials; anisotropic materials; Poisson's ratio; elastic constants; finite element analysis; statistical methods; arrays; Volterra equations; Laplace transforms; bulk modulus  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

877782 78-10774  
**Numerical performance of some finite element schemes for analysis of seepage in porous elastic media**  
 Sandhu, R. S.; Liu, K.; Singh, K. J.  
 Ohio State Univ., Dep. Civ. Eng., Columbus, Ohio, USA  
 Int. J. Numer. Anal. Methods Geomech. 1: 2, 177-194p., 1977  
 ISSN: 0363-9061 15 REFS.  
 Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., sects., tables  
 Descriptors: \*soil mechanics; \*automatic data processing; techniques; engineering geology; computer programs; seepage; elastic materials; porous materials; finite element analysis; statistical methods; pore pressure; mathematical models; models; properties; consolidation; settlement; stress; one-dimensional models; infiltration  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

877781 78-10760  
**Transmitting boundaries; a comparison**  
 Roesset, J. M.; Ettouney, M. M.  
 Mass. Inst. Technol., Dep. Civ. Eng., Cambridge, Mass., USA; Stone & Webster Eng. Corp.  
 Int. J. Numer. Anal. Methods Geomech. 1: 2, 151-176p., 1977  
 ISSN: 0363-9061 10 REFS.  
 Subfile B

877777 78-10527

**Finite deformation of an elasto-plastic soil**

Carter, J. P.; Booker, J. R.; Davis, E. H.  
Int. J. Numer. Anal. Methods Geomech. 1: 1, 25-43p., 1977

ISSN 0363-9061 32 REFS.

Subfile: B

Country of Publ.: International

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Language: English

Illustr.:  
Descriptors: soil mechanics; foundations; deformation; design; elastic materials; embankments; elasticity; mathematical methods; plasticity; plastic materials; strain; failure; Hooke's law; finite element analysis; statistical methods; examples; loading; cohesive materials  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

877776 78-10553

**Consolidation analysis of layered anisotropic foundations**

Desai, C. S.; Saxena, S. K.  
Va. Polytech. Inst. & State Univ., Dep. Civ. Eng., Blacksburg, Va., USA; Int. Inst. Technol. Int. J. Numer. Anal. Methods Geomech. 1: 1, 5-23p., 1977

ISSN: 0363-9061 13 REFS.

Subfile: B

Country of Publ.: International

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Language: English

Illustr.: sects.  
Descriptors: foundations; soil mechanics; land subsidence; geologic hazards; settlement; consolidation; burifings; compaction; anisotropic media; layered media; finite element analysis; statistical methods; Poisson's ratio; elastic constants; Darcy's law; pore water; Hooke's law; waves; planar bedding structures; sedimentary structures; examples; loading; elastic moduli; permeability; sand; clastic sediments; clay; drainage; pore pressure; flexible materials  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

876669 78-10827

**Univariate and multivariate statistical analysis of West Virginia landslide data**

Woodfork, L. D.; Lessing, P.  
W. Va. Geol. Econ. Surv., Morgantown, W. Va., USA  
Geol. Soc. Am. Abstr. Programs 9: 3, 332p., 1977  
CODEN: GAAPBC  
Subfile: B  
Country of Publ.: United States

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Language: English  
Latitude: N371500; N403000 Longitude: W0774500; W0823000  
Descriptors: West Virginia; engineering geology; slope stability; United States; landslides; statistical analysis; univariate analysis; multivariate analysis; failure  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

875390 78-06684

**Mass movement on spoil outcrops of contour surface-mines, North-central West Virginia**

Heger, J. P.  
West Virginia Univ., Morgantown, W. Va., USA  
262p., 1977  
Subfile: B

Degree Level: Doctoral

Country of Publ.: United States

Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Language: English

Diss. Abstr. Int., Vol. 38, No. 4, p. 1622B, 1977.

Latitude: N383000; N403500 Longitude: W0793000; W0813000  
Descriptors: West Virginia; mining geology; engineering geology; evaluation; north-central; mass movements; slope stability; United States; contour mining; statistical analysis; spoils; strip mining; landslides; geologic hazards; coal mines; landslides; geological hazards  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

873114 78-06816

**Soil-structure interaction for nuclear power plants**

Hall, J. R., Jr.; Kissenprehn, J. F.  
E. D'Appolonia Consult. Eng. Inc., Brussels, BEL  
Symposium on earthquake risk for nuclear power plants, Walferdange, Luxembourg, Oct. 20-22, 1975  
North. Meteorol. Inst., Publ. 153, 113-119p., 1976  
7 REFS.

Subfile: B

Country of Publ.: Netherlands

Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC

Language: English

Illustr.:  
Descriptors: nuclear facilities; seismology; soil mechanics; seismicity; soil dynamics; earthquakes; seismic risk; models; mathematical models; lumped parameter analysis; finite element analysis; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

873106 78-06879

**Seismic risk maps of Switzerland; description of the probabilistic method and discussion of some input parameters**

Mayer-Rosa, D.; Merz, H. A.  
 Symposium on earthquake risk for nuclear power plants, Walferdange, Luxembourg, Oct 20-22, 1975  
 Meth., Meteorol. Inst., Publ. 153, 45-51p., 1976  
 10 REFS

Subfile B  
 Country of Publ.: Netherlands  
 Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
 Languages: English

Latitude: N454500; N474500 Longitude: E0103000; E0055000  
 Descriptors: Switzerland; earthquakes; nuclear facilities; engineering geology; magnitude; maps; intensity; seismic risk; Europe; seismicity; models; probability; frequency; acceleration  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

873105 78-06695

**Probability distribution of earthquake accelerations for sites in western Germany**

Ahoner, L.; Rosenhauer, W.  
 Symposium on earthquake risk for nuclear power plants, Walferdange, Luxembourg, Oct. 20-22, 1975  
 Meth., Meteorol. Inst., Publ. 153, 42-43p., 1976  
 5 REFS

Subfile B  
 Country of Publ.: Netherlands  
 Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
 Languages: English

Latitude: N490000; N520000 Longitude: E0100000; E0030000  
 Descriptors: West Germany; automatic data processing; nuclear facilities; engineering geology; earthquakes; seismic risk; Germany; Europe; seismicity; magnitude; acceleration; distribution; models; maps; seismicity maps  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

873103 78-07017

**The UK approach to hazard assessment**

Willmore, P. L.; Burton, P. W.  
 Symposium on earthquake risk for nuclear power plants, Walferdange, Luxembourg, Oct. 20-22, 1975  
 Meth., Meteorol. Inst., Publ. 153, 35-37p., 1976  
 3 REFS

Subfile B  
 Country of Publ.: Netherlands

Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
 Languages: English

Latitude: N500000; N610000 Longitude: E0013000; W0080000  
 Descriptors: United Kingdom; geologic hazards; nuclear facilities; engineering geology; earthquakes; magnitude; seismic risk; Europe; intensity; epicenters; methods; mathematical methods; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

873102 78-06966

**Probability model for peak ground accelerations in Sweden**

Slunga, R.  
 Symposium on earthquake risk for nuclear power plants, Walferdange, Luxembourg, Oct. 20-22, 1975  
 Meth., Meteorol. Inst., Publ. 153, 27-34p., 1976  
 7 REFS

Subfile B  
 Country of Publ.: Netherlands  
 Doc Type SERIAL; CONFERENCE PUBLICATION Bibliographic Level ANALYTIC  
 Languages: English

Latitude: N551500; N691500 Longitude: E0241500; E0110000  
 Descriptors: Sweden; nuclear facilities; engineering geology; earthquakes; seismic risk; Europe; acceleration; magnitude; focus; ground motion; models; mathematical models; epicenters; frequency; distribution; Stockholm; Goteborg; Malmo  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

871418 78-02891

**Calculated and observed subsidence and horizontal movements at Baldwin Hills, California**

Lee, K. C.  
Univ. Calif. Sch. Eng. Appl. Sci., Los Angeles, Calif., USA  
Second International Symposium on Land Subsidence, Anaheim, Calif., United States, Dec. 13-17, 1976  
Int. Symp. Land Subsidence, Symp. Program 2, unpaginated p., 1976

Subfile: B  
Country of Pub.: International  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Latitude: N340000; W1174500 Longitude: W1174500; W1183000  
Descriptors: California; engineering geology; Los Angeles County; land subsidence; United States; geologic hazards; dams; failure; causes; petroleum; production; finite element analysis; statistical methods; Baldwin Hills  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

869698 78-02921

**Earthquake parameters from extreme value statistics**

Makropoulos, C.; Burton, P. W.  
U.K. Geophysical Assembly, Edinburgh, United Kingdom, April 12-15, 1977  
R. Astion, Soc., Geophys. J. 49: 1, 307p., 1977  
CODEN: GEQUAN

Subfile: B  
Country of Pub.: United Kingdom  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English  
Latitude: N650000; W650000 Longitude: W0700000; E1100000  
Descriptors: Pacific region; Greece; seismology; engineering geology; earthquakes; geologic hazards; Circum-Pacific region; Europe; magnitude; statistical analysis; seismic risk  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

869301 78-03019

**Design construction and performance of a slurry trench wall next to foundations**

Rosenberg, P.; St. Arnaud, G.; Journeaux, N. L.; Vallee, H.  
Centre Techn. Appl. Limitee, Montreal, CAN.; Regis Trudeau Assoc.

Slope stability: 29th Canadian geotechnic conference; October 13-16, 1978; Bayshore Inn, Vancouver, B.C.  
Slope stability: 29th Canadian geotechnical conference, Campanella, D. (chairperson)

Vancouver, B.C., Canada, Oct. 13-16, 1976  
Pub.: Can. Geotech. Soc.  
IX: 1: IX: 25p., 1976  
11 REFS.

Subfile: B  
Country of Pub.: Canada  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus., tables  
Latitude: N453000; W453000 Longitude: W0733600; W0733600  
Descriptors: Quebec; engineering geology; slope stability; excavations; foundations; loading; settlement; Canada; design; construction; finite element analysis; statistical methods; till; clastic sediments; Montreal  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

869299 78-02697

**Effective stress finite element slope analysis**

Byrne, P. M.

Slope stability: 29th Canadian geotechnical conference; October 13-16, 1978; Bayshore Inn, Vancouver, B.C.

Slope stability: 29th Canadian geotechnical conference, Campanella, D. (chairperson)  
Vancouver, B.C., Canada, Oct. 13-16, 1976  
Pub.: Can. Geotech. Soc.  
VIII: 35-VIII: 55p., 1976  
12 REFS.

Subfile: B  
Country of Pub.: Canada  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.  
Descriptors: slope stability; failure; shear stress; strain; loading; soil mechanics; consolidation; compaction; finite element analysis; statistical methods; layered media; erosion; excavations  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

969225 78 03038

**Einfluss der Sprengtechnik und der Lagerstaetenstruktur auf die Staerke und Ausbreitung von Bodenerschuetterungen bei Gewinnsprengeungen**  
**Influence of the blasting technique and the structure of the deposit on the intensity and distribution of earthquakes caused by blasting**

Schubart, H.; Thuemmel, E  
 Geol. Jahrb., Reihe E, 6, 11:30p., 1976  
 CODEN GUBFAO 33 REFS.

Subfile B  
 Country of Publ.: Germany, Federal Republic of  
 Doc Type SERIAL Bibliographic Level ANALYTIC  
 Languages German Summary Languages English  
 illus., tables

Descriptors: \*West Germany; \*geologic hazards; \*earthquakes  
 ; engineering geology; causes ; explosions; Germany;  
 Europe; mining geology; quarries; distribution;  
 Rhine-Westphalian Basin; Dornap; statistical analysis;  
 limestone; carbonate rocks  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

868702 78-02881

**Algunas relaciones macrosismicas para la evaluacion del riesgo sismico en Chile**  
**Microseismic relations for the seismic risk evaluation in Chile**

Labbe, J. C.; Goldmark, A.; Saraceni, G. R.  
 Segundas Jornadas Chilenas de sismologia e ingenieria antisismica, Santiago, Chile, July 26-30, 1976  
 Jornadas Chil. Sismol. Ing. Antisismica, [Publ.] 2, Volume II, F7 1 F7 14p., 1976

21 REFS.

Subfile B  
 Country of Publ. Chile  
 Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC

Languages Spanish  
 illus., tables  
 Latitude 5660000; 5174500 Longitude W0670000; W0760000  
 Descriptors: \*Chile; \*seismology; engineering geology; seismicity; geologic hazards; microseisms; earthquakes; seismic risk; South America; statistical analysis; magnitude; acceleration; epicenters  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

869690 78-02261

**Statistical study of earthquake response spectra**  
 Riddell, R.; Newmark, N. M.  
 Univ. Ill., Urbana, Ill., USA  
 Segundas Jornadas Chilenas de sismologia e ingenieria

antisismica, Santiago, Chile, July 26-30, 1976  
 Jornadas Chil. Sismol. Ing. Antisismica, [Publ.] 2, Volume II, B2 1-B2 15p., 1976

11 REFS.

Subfile B  
 Country of Publ.: Chile  
 Doc Type SERIAL: CONFERENCE PUBLICATION Bibliographic Level ANALYTIC

Languages English  
 Note With discussion, illus., tables  
 Descriptors: \*seismology; earthquakes; ground motion; amplitude; spectra; velocity; acceleration; statistical analysis; engineering geology  
 Section Headings 19 (GEOPHYSICS, SEISMOLOGY)

867606 77-47410

**The behaviour of clays containing pre-existing discontinuities**

Williams, A. A. R.  
 Univ. of Witwatersrand, ZAF  
 unpaginatedp., 1976

Subfile B  
 Degree Level: Doctoral  
 Country of Publ.: South Africa  
 Doc Type THESTS Bibliographic Level MONOGRAPHIC

Languages English  
 Diss. Abstr. Int., Vol. 38, No. 2, p. 821-822B, 1977.  
 Latitude: S350000; S220000 Longitude: E0330000; E0160000  
 Descriptors: \*South Africa; engineering geology; soil mechanics; clays; behavior; excavations; monitoring; field studies; statistical analysis; automatic data processing; Africa  
 Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

86576 77 47452  
**Geomorphology and hydrology of selected midwestern streams**  
 Fingar, D. E.  
 Purdue Univ., West Lafayette, Indiana, USA  
 40RP, 1976  
 Subfile B  
 Degree level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS  
 Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 38, No. 2, p. 556B, 557B, 1977.  
 Latitude: N370000; Longitude: W0850000, W1023000  
 Descriptors: Indiana; geomorphology; Illinois; Kansas;  
 hydrology; fluvial features; rivers and streams;  
 regional; United States; flow; floods; discharge;  
 channels; channel geometry; drainage patterns; statistical  
 analysis; engineering geology; streams; statistical  
 meanders; field studies  
 Section Headings: 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

86502B 77-46987  
**Statistical variation of the compliance of coal**  
 Atkinson, R. H.; Ko, H.-Y.  
 Atkinson-Noland & Assoc., Boulder, Colo., USA; Univ. Colo.  
 Second international conference on numerical methods in  
 geomechanics, Blacksburg, Va., United States, June 20-25,  
 1976  
 Int. Conf. Numer. Methods Geomech., [Proc.] 2, Vol. 1,  
 367-380p, 1976  
 11 REFS.

86529 77 47056  
**Engineering evaluation of seabed sediments by cluster analysis**  
 Crossin, B.; Cubitt, J.; McLean, D. M.; McQuillan, R.  
 25th international geological congress, Sydney, Australia,  
 Aug. 12-24, 1976  
 Int. Geol. Congr. Abstr. Congr. Geol. Int., Reclams 25,  
 Vol. 2, Sect. 16E, Mathematical geology, 631-632p., 1976  
 CODEN: ISAREY  
 Subfile B  
 Country of Publ.: Various  
 Doc Type: SERIAL  
 CONFERENCE PUBLICATION  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: engineering geology; materials; properties  
 sediments; marine environment; evaluation; statistical  
 analysis; cluster analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

865466 77 47226  
**Prüfmethoden der mechanischen Eigenschaften von verschiedenen Sanden**  
 Testing the mechanical properties of sand  
 Mikulski, J.  
 12th conference on silicate industry and silicate science,  
 Budapest, Hungary, June 6-11, 1977  
 Conf. Silic. Ind. Silic. Sci., Proc. 12, Part 2, 869-878  
 P., 1977  
 CODEN: PCOSAY 12 REFS  
 Subfile B  
 Country of Publ.: Hungary

Doc Type: SERIAL; CONFERENCE PUBLICATION  
 Bibliographic Level: ANALYTIC  
 Languages: German  
 Summary Languages: Hungarian  
 Illustr.  
 Descriptors: gravel; engineering geology; resources;  
 properties; materials; grain size; shape; strength;  
 statistical analysis; experimental studies; sediments; sand  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

86502B 77-46987  
**Statistical variation of the compliance of coal**  
 Atkinson, R. H.; Ko, H.-Y.  
 Atkinson-Noland & Assoc., Boulder, Colo., USA; Univ. Colo.  
 Second international conference on numerical methods in  
 geomechanics, Blacksburg, Va., United States, June 20-25,  
 1976  
 Int. Conf. Numer. Methods Geomech., [Proc.] 2, Vol. 1,  
 367-380p, 1976  
 11 REFS.

Subfile B  
 Country of Publ.: International  
 Doc Type: SERIAL; CONFERENCE PUBLICATION  
 Bibliographic Level: ANALYTIC  
 Languages: English  
 Illustr.: tables  
 Latitude: N373000; Longitude: W0884500; W0891500  
 Descriptors: engineering geology; Illinois; materials;  
 properties; Franklin County; coal; compliance; pressure;  
 variations; statistical analysis; Monte Carlo analysis;  
 mathematical models; United States; Old Ben Mine No. 2  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

864664 77-47062  
Rezultaty ispol'zovaniya korrelyatsionnogo i regressionnogo analizov dlya opredeleniya faktorov, vliyayushchikh na velichinu penerabotki beregov Volgogradskogo vodokhranilishcha  
Results of the application of correlation and regression analyses to the determination of factors influencing the reworking of the shores of the Volgograd water reservoir  
Dmitriyev, V. V.  
Vestn. Uchenykh Zaved. Izv. Geol. Razved. 8. 112-117p. 1975  
CODEN IVUGAF  
Subfile B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Russian  
Tables  
Latitude: N504000; Longitude: E0452500; E0422500  
Descriptors: USSR; engineering geology; reservoirs; Volgograd Reservoir; surface reservoirs; shorelines; erosion; statistical analysis; correlation coefficient  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

864091 77-48165  
Production statistics and engineering data, oil in North Dakota; second half of 1976  
North Dakota Geological Survey, Grand Forks, N.D., USA  
Publ.: N.D. Geol. Surv.  
267p., 1977  
Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: MONOGRAPHIC  
Languages: English  
Tables  
Latitude: N455500; N490000 Longitude: W0963000; W1040000  
Descriptors: North Dakota; petroleum; economic geology; United States; engineering geology; production; data  
1976  
Section Headings: 29 (ECONOMIC GEOLOGY, ENERGY SOURCES)

864618 77-47233  
A Bayesian approach to seismic hazard mapping; development of stable design parameters  
Morgan, C. P.  
Stanford Univ., Stanford, Calif., USA  
3-PRERECFP. 1977  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Inf., Vol. 37, No. 12, Part 1, p. 6247B, 1977.  
Latitude: N100000; N150000 Longitude: W0833000; W0874000  
Descriptors: Nicaragua; engineering geology; earthquakes; environmental geology; geologic hazards; Central America; mapping; statistical methods; seismic risk; Bayesian functions  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

864617 77-47151  
Probabilistic hazard mapping; development of site dependent seismic load parameters  
Kiremidjian, A. S.  
Stanford Univ., Stanford, Calif., USA  
233p., 1977  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

864617 77-47151  
Probabilistic hazard mapping; development of site dependent seismic load parameters  
Kiremidjian, A. S.  
Stanford Univ., Stanford, Calif., USA  
233p., 1977  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Run-sums of annual flow series  
Sen, Z.  
J. Hydrol. 35 3-4. 311-324p., 1977  
CODEN JHYDA7  
Subfile: B  
Country of Publ.: International  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Tables  
Descriptors: engineering geology; hydrology; reservoirs; methods; surface reservoirs; statistical methods; water; flow; systems; design  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

**Asymptotic distribution of maximum deficit for linearly dependent inflows in full flow regulation**

Murty, K. N.; Yevjevich, V.  
Eng. Comput. Inc., Denver, Colo., USA; Colo. State Univ.,  
J. Hydrul., 35, 3-4, 299-309p., 1977  
CODEN JHROA7  
Subfile B  
Country of Publ. International  
Doc. Type SERIAL Bibliographic Level ANALYTIC  
Languages English  
Titles  
Descriptors: engineering geology; hydrology; reservoirs;  
methods; surface reservoirs; water; inflow; storage;  
statistical methods; stochastic processes; flow; models;  
mathematical models  
Section Headings 21 (HYDROGEOLOGY AND HYDROLOGY)

862241 77-43010

**Raschet povtoryayemosti i aktivnosti opolznevnykh protsessov  
Calculation of recurrence and intensity of landslide  
processes**

Kuchinov, V. K.  
Sov. Geol., 5, 142-149p., 1975  
CODEN SVGLA2 4 REFS  
Subfile B  
Country of Publ. Union of Soviet Socialist Republics  
Doc. Type SERIAL Bibliographic Level ANALYTIC  
Languages Russian  
Descriptors: engineering geology; geomorphology;  
geologic hazards; mass movements; landslides; recurrence;  
intensity; prediction; statistical methods  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

860923 77-42969

**Earthquake injuries related to housing in a Guatemalan  
village**

Glaser, P. L.; Urrutia, J. J.; Garcia, B.; Rizzuto, C.; Guevry,  
C.; Smith, H.  
Mount Sinai Sch. Med., Dep. Med., New York, N.Y., USA  
Science (ARAB) 197, 4704, 638-643p., 1977  
CODEN SCIEAS 14 REFS  
Subfile B  
Country of Publ. United States  
Doc. Type SERIAL Bibliographic Level ANALYTIC  
Languages English  
Titles: tables; sketch map  
Latitude N140000 Longitude W086000 W086000  
Descriptors: Guatemala; engineering geology; earthquakes;  
environmental geology; Central America; geologic hazards  
Guatemala; Mayan; Guaymas; buildings; structures; damage;  
construction; materials; effects; injuries;

**Application of linear statistical models of earthquake  
magnitude versus fault length in estimating maximum expectable  
earthquakes**

Mark, R. K.  
U. S. Geol. Surv., Open-File Rep., 77-549, 15p., 1977  
CODEN XGRDAG 9 REFS  
Subfile B  
Country of Publ. United States  
Doc. Type SERIAL Bibliographic Level MONOGRAPHIC  
Languages English  
Titles  
Descriptors: engineering geology; earthquakes; seismic  
risk; seismicity; estimation; statistical methods;  
magnitude; faults; length  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

858056 77-38615

**Mean densities of pre-Devonian sedimentary rocks in Poland  
and their depth dependence**

Dabrowski, A.  
Colloquium on petrophysical properties of rocks, Aarhus,  
Denmark, Oct. 29-31, 1974  
Pure Appl. Geophys., 114, 2 Selected topics in petrophysics  
251-262p., 1976  
CODEN PAGYAV 3 REFS.  
Subfile B  
Country of Publ. Switzerland  
Doc. Type SERIAL CONFERENCE PUBLICATION Bibliographic  
Level ANALYTIC  
Languages English  
Titles: tables

Latitude N490000 Longitude E0240000; E0141500  
Descriptors: Poland; engineering geology; paleozoic;  
tectonics; materials; properties; Europe; vertical  
tectonics; sedimentary rocks; regions; density; depth;  
data; statistical analysis; applications; uplifts;  
displacements; estimation; samples; Cambrian; Ordovician;  
Silurian  
Section Headings 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

AD-A136 355

COMPENDIUM OF ABSTRACTS ON STATISTICAL APPLICATIONS IN  
GEOTECHNICAL ENGIN..(U) ARMY ENGINEER WATERWAYS  
EXPERIMENT STATION VICKSBURG MS GEOTE..

6/6

UNCLASSIFIED

M E HYNES-GRIFFIN ET AL. SEP 83

F/G 13/2

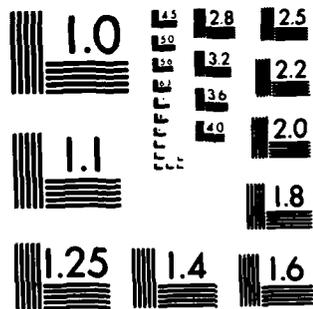
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963 A

857173 77-38688

**Probabilistic evaluation of liquefaction of sand under earthquake motions**

Haider, A.  
 Univ. of Illinois, Urbana, Ill., USA  
 25p., 1976  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 37, No. 10, p. 5247B, 1977.  
 Descriptors: 'engineering geology'; earthquakes; sand; liquefaction; probability; statistical methods; soil mechanics  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

856644 77-38775

**Relationship between earthquake damage of existing wooden houses and seismic intensities**

Kuribayashi, E.; Hachida, T.  
 Eighth joint panel conference of the U. S.-Japan cooperative program in natural resources. Gaithersburg, Md., United States, May 18-21, 1976  
 U. S. Natl. Bur. Stand., Spec. Publ. 477, IV.1-IV.17p., 1977  
 CODEN: XNBSAV 11 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., sketch maps  
 Latitude: N370000 Longitude: E1400000; E1300000  
 Descriptors: 'Japan'; 'engineering geology'; 'earthquakes'; Asia; south; Fukui; Isehanto-Oki; Kyushu; seismicity; epicenters; magnitude; intensity; damage; buildings; wooden houses; quantitative analysis; statistical analysis; relation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

856630 77-38703

**The regional distribution of the earthquake danger in Japan**

Iattori, S.; Kitagawa, Y.; Santo, T.  
 Seventh joint panel conference of the U. S.-Japan cooperative program in natural resources, Tokyo, Japan, May 20-23, 1975  
 U. S. Natl. Bur. Stand., Spec. Publ. 470, III.1-III.17p., 1977  
 CODEN: XNBSAV 6 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table, sketch maps  
 Latitude: N300000 Longitude: E1400000; E1290000  
 Descriptors: 'Japan'; 'earthquakes'; 'engineering geology'; seismology; Asia; regional; distribution; mapping; amplitude; frequency; causes; effects; displacements; statistical analysis; seismic risk  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

856445 77-38618

**Site-dependent seismic response spectra for soft sites**

Datta, J. S.; Seed, H. B.; Wu, D.-L.  
 United Eng. Constr., Inc., Phila., Pa., USA; Univ. Calif., Berkeley  
 Am. Soc. Civ. Eng., Proc., J. Power Div. 103: P01, 15-25 p., 1977  
 12 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table  
 Descriptors: 'engineering geology'; soil mechanics; soft materials; seismic response; statistical analysis; earthquakes; seismic risk; site exploration; design; nuclear facilities; power plants  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

856006 77-38872

Computer analysis of flat-slab type mat foundations using finite difference method  
Paramarivam, P.

Analysis of soil behaviour and its application to geotechnical structures; proceedings of the technical session of the symposium held at the University of New South Wales, Australia; July 14-18, 1978

Valliapan, S.(EDITOR); Main, S.(EDITOR); Lee, I. K.(EDITOR)  
Analysis of soil behaviour and its application to geotechnical structures. Kensington, N.S.W., Australia, July, 14-18, 1975

Publ: Unisearch Ltd.  
99-112p., 1977  
6 REFS.

Subfile: B

Country of Publ.: Australia

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus., table

Descriptors: engineering geology; automatic data processing; foundations; soil mechanics; shear stress; programs; statistical analysis; finite difference method

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

855341 77-35256

Earthquake analysis of arch dam-foundation systems

Mojtahedi, S.  
Univ. of California, Berkeley, Berkeley, Calif., USA  
136p., 1976

Subfile: B

Degree Level: Doctoral

Country of Publ.: United States

Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Languages: English

Diss. Abstr. Int., Vol. 37, No. 9, p. 4588B, 1977.

Descriptors: engineering geology; earthquakes; foundations; structures; dams; arch dams; systems;

statistical analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

853855 77-35304

Prediction of littoral drift for lakes and bays from wind observations

Rubin, M.; Walton, T. L., Jr.  
Univ. Fla., Civ. Eng. Dep., Gainesville, Fla., USA  
Southeast. Geol., 18: 2, 119-127p., 1976

COMEN: SDGEAY 13 REFS.

Subfile: B

Country of Publ.: United States

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus., sketch map

Latitude: N301500; N303000 Longitude: W0860000; W0864500

Descriptors: Florida; engineering geology; shorelines;

Okaloosa County; Walton County; west; Choctawhatchee Bay;

sedimentation; beaches; littoral drift; changes;

prediction; wind; statistical analysis; applications;

lakes; bays; United States

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

853399 77-35299

Optimum seismic design and research of single-degree systems  
Rosenblueth, E.

Structural and geotechnical mechanics

Hall, W. J.(EDITOR)

Structural and geotechnical mechanics, Urbana, Ill.,

United States, Oct. 2-3, 1975

Publ: Prentice-Hall, Inc.  
403-419p., 1977

Subfile: B

7 REFS.

Country of Publ.: United States

Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

Note: With appendices, illus., tables

Descriptors: engineering geology; earthquakes;

structures; design; methods; mathematical methods;

probability

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

852974 77-35099  
**Investigation and statistical analysis of the geotechnical properties of coal mine refuse**  
 Chen, C. Y.  
 Univ. of Pittsburgh, Pittsburgh, Pa., USA  
 210p., 1976  
 Subfile: B  
 Degree Level: Doctoral  
 Country of Publ.: United States  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 37, no. 8, p. 4078B-4079B, 1977.  
 Descriptors: engineering geology; waste disposal; solid waste; engineering properties; statistical analysis; coal mines; mining geology  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

852478 77-35076  
**Permeability tests for hydrodynamic simulation model of a rock mass in the foundation of a dam; case study of the Grancarevo Dam**  
 Borell, M.; Milivojevic, M.  
**Karst hydrology and water resources; proceedings of the United States-Yugoslavian symposium, Dubrovnik, June 2-7, 1975; Vol. 2, Karst water resources**  
 Yevjevich, V. (EDITOR)  
 United States-Yugoslavian symposium on karst hydrology and water resources, Dubrovnik, Yugoslavia, June 2-7, 1975  
 Publ.: Water Resour. Publ.  
 575-608p., 1976  
 11 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: With discussion. illus., sect., geo., sketch map  
 Latitude: N420000; N460000 Longitude: E0200000; E0180000  
 Descriptors: Yugoslavia; engineering geology; foundations; Grancarevo Dam; dams; rocks; properties; permeability; models; mathematical models; hydrodynamics; statistical analysis; factors; piezometry; discharge; pump tests; tracer experiments; Europe  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

852097 77-35327  
**Eastern Siberia**  
 Solovniko, V. P.  
**Seismic zoning of the USSR**

Medvedev, S. V. (EDITOR)  
 Publ.: Keter Publ. House Jerusalem, Ltd.  
 393-409p., 1976  
 Subfile: B  
 Country of Publ.: Israel  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, pool, sketch map  
 Latitude: N510000; N600000 Longitude: E1230000; E0900000  
 Descriptors: seismology; maps; USSR; engineering geology; seismicity; earthquakes; epicenters; frequency; magnitude; intensity; neotectonics; zoning; statistical analysis; Siberia; Baikal; Kirensk  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

850943 77-31254  
**Design**  
 Whitman, R. V.; Cornell, C. A.  
 Mass. Inst. Technol., Dep. Civ. Eng., Cambridge, Mass., USA  
**Seismic risk and engineering decisions**  
 Lonnitz, C. (EDITOR); Rosenblueth, E. (EDITOR)  
 Publ.: Elsevier Sci. Publ. Co.  
 339-380p., 1976  
 31 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables, sketch map  
 Descriptors: engineering geology; earthquakes; seismic risk; site exploration; structures; design; statistical analysis; probability; examples  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

850918 77-31238

Application of finite element method to soil deformation  
Vallilappan, S.

Soil mechanics; recent developments  
Vallilappan, S. (EDITOR); Main, S. (EDITOR); Lee, I. K. (EDITOR)  
Soil mechanics; recent developments, Kensington, N.S.W.,  
Australia, July 14-18, 1975  
Publ.: Univ. N.S.W.  
113-142p., 1975  
67 REFS.

Subfile: B  
Country of Publ.: Australia  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English

Descriptors: \*engineering geology; \*mathematical geology;  
soil mechanics; principles; deformation; plasticity;  
creep; applications; statistical analysis; finite element  
analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

850322 77-29189

Sound-velocity characteristics of sediment from the eastern  
South American margin

Houtz, R. E.  
Lamont-Doherty Geol. Obs., Palisades, N.Y., USA  
Geol. Soc. Am., Bull. 88: 5, 720-722p., 1977  
CODEN: BUGCMA; 4 REFS.

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
illus., table, sketch map  
Latitude: 5650000; N1000000 Longitude: W03000000; W07000000  
Descriptors: \*Atlantic Ocean; \*sediments; \*engineering  
geology; \*oceanography; properties; materials; South  
Atlantic; South America; acoustical properties; continental  
margin; data; sonobuoys; statistical analysis  
Section Headings: 07 (MARINE GEOLOGY AND OCEANOGRAPHY)

849755 77-31040

Damaging earthquake probability studies in the eastern U.S.  
and their potential applications to nuclear power plant siting

Chimney, M. A.  
Mass. Inst. Technol., Cambridge, Mass., USA  
The Geological Society of America Northeastern Section, 11th  
annual meeting, and Southeastern Section, 25th annual meeting,  
Arlington, Va., United States, March 25-27, 1976  
Geol. Soc. Am., Abstr. Programs 8: 2, 150-151p., 1976

CODEN: GAAPBC

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC

Languages: English  
Descriptors: \*United States; \*engineering geology; nuclear  
facilities; east; foundations; geologic hazards; site  
exploration; seismicity  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

847853 77-31198

Statistical estimation and prediction of avalanche activity  
from meteorological data for the Rogers Pass area of British  
Columbia

Salway, A. A.  
British Columbia  
unpaginatedp., 1976  
O. REFS.

Subfile: B  
Degree Level: Doctoral

Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Int., Vol. 37, No. 7, p. 3324B-3325B, 1977  
Descriptors: \*British Columbia; \*engineering geology;  
\*environmental geology; slope stability; geologic hazards;  
Rogers Pass; avalanches; activity; prediction; models;  
meteorology; statistical analysis; Canada  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 847328 77-27112  
Dopit ispol'zovaniya analiza glavnykh sostavlyayushchikh pri-  
izucheniim inzhenerno-geologicheskoy izmarchivovoi gornyykh  
porod  
The utilization of engineering experiments in the analysis  
of the principal components of various rocks  
Kolomanskii, Ye. N.; Serra, Zh.; Sokolova, L. F.  
Vyssh. Uchebn. Zaved., Izv., Geol. Razved. 2, 105-110p.,  
1975  
CODEN: IWUGAF 6 REFS.  
Subfile: B  
Country of Publ.: Union of Soviet Socialist Republics  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Russian  
Descriptors: engineering geology; USSR; materials;  
properties; rocks; soils; experimental studies; methods;  
graphic display; principal components analysis; Minusinsk  
Basin; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 847179 77-27154  
Prediction of the transition probabilities of various alert  
stages during rising flood  
Ngv, I. V.  
Period. Polytech., Civ. Eng. 16: 4, 211-217p., 1972  
CODEN: PPCBAD 3 REFS.  
Subfile: B  
Country of Publ.: Hungary  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: Hungary; engineering geology; hydrology;  
neologic hazards; rivers and streams; Tisza River; floods;  
prediction; stochastic processes; methods; mathematical  
methods; probability; Markov processes; Europe; gauging  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 847129 77-27048  
Reservoir planning and operation  
Fiering, M. B.  
Harv. Univ., Cambr., Mass., USA  
Stochastic approaches to water resources; Volume II  
Shen, H. W. (EDITOR)  
Publ.: Privately published  
17: 1-17: 21p., 1976  
19 REFS.  
Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English
- 844752 77-26891  
Random maze models of flow through porous media  
Torelli, L.; Scheidegger, A. E.  
Pure Appl. Geophys. 89, 32-44p., 1971  
CODEN: PAGVAV 5 REFS.  
Subfile: B  
Country of Publ.: Switzerland  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: mathematical geology; hydrogeology;  
theoretical studies; flow; porous media; models;  
stochastic processes; applications; hydrology; hydraulics;  
engineering geology; environmental geology; soils;  
hydrodynamics; statistical methods  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)
- 844227 77-26993  
Civil structures and earthquake safety  
Blume, J. A.  
John A. Blume and Assoc., San Franc., Calif., USA  
Earthquake Risk  
Publ: Calif., Jt. Comm. Seism. Saf.  
109-115p., 1971  
Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: engineering geology; earthquakes; seismic  
risk; structures; buildings; damage; evaluation;  
statistical analysis; theoretical studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Problems in the establishment of practical safety goals in transportation**

Raisbeck, G.  
Arthur D. Little, Inc., Camb., Mass., USA  
**Earthquake risk**  
Publ.: Calif., Jr. Comm. Seism. Saf.  
25-30p., 1971  
Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: engineering geology ; practice ; safety ;  
risk; transportation; evaluation; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**A systematic approach to uncertainty and risk**

Breika, I. T.  
Stanford Univ., Stanford, Calif., USA  
**Earthquake risk**  
Publ.: Calif., Jr. Comm. Seism. Saf.  
19-24p., 1971  
Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: engineering geology ; earthquakes ; seismic  
risk; statistical analysis; probability  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Social benefits vs. risk**

Starr, C.  
Univ. Calif., Los Ang., Calif., USA  
**Earthquake risk**  
Publ.: Calif., Jr. Comm. Seism. Saf.  
5-14p., 1971  
Subfile: B  
Country of Publ.: United States  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus., table  
Descriptors: engineering geology ; earthquakes ; seismic  
risk; statistical analysis; land use; regional planning;  
site exploration  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

844042 77-25845

**Statistical models of flow through porous media**

Liao, K. H.; Scheidegger, A. E.  
Univ. Ill., Urbana, Ill., USA  
Pure Appl. Geophys. 83, 74-81p., 1970  
CODEN: PAGYAV 12 REFS.  
Subfile: B  
Country of Publ.: Switzerland  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: mathematical geology; ground water ; methods  
; hydrodynamics ; statistical methods; models; review;  
flow; porous media; applications; hydrogeology;  
engineering geology  
Section Headings: 15 (MISCELLANEOUS & MATHEMATICAL GEOLOGY)

841304 77-22754

**The time of occurrence and the magnitude of the largest aftershock over India**

Chaudhury, H. M.; Srivastava, H. N.  
Pure Appl. Geophys. 105, 770-780p., 1973  
CODEN: PAGYAV 11 REFS.  
Subfile: B  
Country of Publ.: Switzerland  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, sketch maps  
Descriptors: India; earthquakes ; seismology; Asia ;  
regional; 1963-1971; aftershocks; magnitude; occurrence;  
time; statistical analysis; applications; engineering  
geology  
Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

- 840752 77-23178  
**Ground stability problems: to what extent are they responsible for accidents in underground mines?**  
 Job, A. I.; Everett, M. D.  
 Can. Rock Mech. Symp., Proc. 10, Vol. 1, 55-68p., 1975  
 CODEN: PCRSBF 6 REFS.  
 Subfile: B  
 Country of Publ.: Canada  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*engineering geology; \*Quebec; \*mining geology  
 ; slope stability; production control; rock falls;  
 collapse; mines; quarries; accidents; statistical analysis  
 ; 1960-1972; Canada  
 ; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 839685 77-23200  
**Essai methodologique d'utilisation d'un fichier de donnees geotechniques: documentation, cartographie, traitements statistiques**  
**Methodologic study of the utilization of a card-index of engineering geology data: documentation, cartography, statistical analysis**  
 Mahieu, J.-L.  
 Lab. Ponts Chausees, Bull. Liaison 76, 123-131p., 1975  
 CODEN: LBLAE 4 REFS.  
 Subfile: B  
 Country of Publ.: France  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: French Summary Languages: English  
 illus.  
 Descriptors: \*France; \*engineering geology; \*automatic data processing; soil mechanics; Rouen; methods; information systems; data storage; card-index; statistical analysis; graphic display; maps; Europe  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 837357 77-19929  
**A new method of evaluation for dimension stone from diamond-drill core**  
 Sengupta, M.  
 Morrison-Knudson Co., Boise, Idaho, USA  
 Can. Min. Metall. Bull. 68, 759, 65-70p., 1975  
 CODEN: CMRRAZ 11 REFS.  
 Subfile: B  
 Country of Publ.: Canada  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*construction materials; \*engineering geology
- 836295 77-18337  
**Statistical seismicity including geologic evidence**  
 Bell, J. M.; Hoffman, R. A.  
 Converse Davis Dixon Assoc., San Francisco, Calif., USA  
 Eng. Geol. Soils Eng. Symp., Proc. 14, 105p., 1976  
 CODEN: EGSSBT 0 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*seismology; \*California; \*seismicity; earthquakes; faults; magnitude; statistical analysis; engineering geology; United States; San Fernando Fault; Holy Cross Hospital; Newport-Inglewood Fault; Long Beach Harbor  
 Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)
- 833297 77-15223  
**Earthquake hazard in New England**  
 Shakal, A. F.; Toksoz, M. N.  
 Mass. Inst. Technol., Dep. Earth Planet. Sci., Camb., Mass., USA  
 Science (AAAS) 195, 4274, 171-173p., 1977  
 CODEN: SCIEAS 12 REFS.  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table, sketch map  
 Descriptors: \*New England; \*environmental geology; earthquakes; \*engineering geology; \*seismology; geologic hazards; United States; south; seismicity; data; 1725-1974; statistical analysis; occurrence; estimation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

831908 77-13951  
Considerations for automated digital terrain models with  
Applications in differential photo mapping  
Ayeni, D. O.  
Ohio State: Columbus  
208p., 1976  
O REFS.  
Subfile: B  
Degree Level: Doctoral  
Doc Type: THEISIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Int., Vol. 37, No. 5, p. 2120B, 1976.  
Descriptors: \*automatic data processing; \*engineering  
geology; \*maps; \*methods; cartography; photogeology;  
mapping; terrain classification; models; programs; ATODIM;  
geodesy; statistical methods; terrain; classification;  
applications  
Section Headings: 14 (AREAL GEOLOGY, MAPS AND CHARTS)

827059 77-06948  
A line-source model for seismic risk analysis  
Der Klureghian, A.  
Illinois: Urbana-Champaign  
145p., 1976  
Subfile: B  
Degree Level: Doctoral  
Doc Type: THEISIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Int., Vol. 37, No. 1, p. 367B, 1976.  
Descriptors: \*engineering geology; earthquakes; seismic  
risk; models; faults; slip; statistical analysis;  
applications; United States; California; San Francisco;  
West Indies; Puerto Rico; San Juan  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

824445 77-06974  
Kriterien und Möglichkeiten fuer die Speicherung von Gas in  
Deutschen Erdöl- und Erdgaslagerstätten  
Criteria and importance of gas storage in German oil and gas  
deposits  
Gralla, G.-J.; Luebben, H.  
Ohio State: Columbus  
207p., 1976  
Subfile: B  
Degree Level: Doctoral  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: German Summary Languages: English  
Illus., sketch map  
Descriptors: \*engineering geology; \*Germany; reservoirs;  
subsurface; gas storage; utilization; permeability;  
porosity; analysis; statistical analysis; west  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

828336 77-11050  
Filtering prediction and interpolation in photogrammetry  
Rampal, K. K.  
Ohio State: Columbus  
207p., 1976  
O REFS.  
Subfile: B  
Degree Level: Doctoral  
Doc Type: THEISIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Int., Vol. 37, No. 2, p. 656B, 1976.  
Descriptors: \*engineering geology; geodesy; methods;  
geodetic coordinates; photogrammetry; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

827063 77-07141  
Analysis of response of large embankments to traveling base  
motions  
Urduva, T.  
California: Berkeley  
351p., 1975  
Subfile: B  
Degree Level: Doctoral  
Doc Type: THEISIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Int., Vol. 37, No. 1, p. 375B-376B, 1976.  
Descriptors: \*engineering geology; \*automatic data  
processing; earthquakes; embankments; dams; earthworks;  
response; ground motion; statistical analysis; analysis;  
programs; TRIP; TRAVEL  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

824445 77-06974  
Kriterien und Möglichkeiten fuer die Speicherung von Gas in  
Deutschen Erdöl- und Erdgaslagerstätten  
Criteria and importance of gas storage in German oil and gas  
deposits  
Gralla, G.-J.; Luebben, H.  
Ohio State: Columbus  
207p., 1976  
Subfile: B  
Degree Level: Doctoral  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: German Summary Languages: English  
Illus., sketch map  
Descriptors: \*engineering geology; \*Germany; reservoirs;  
subsurface; gas storage; utilization; permeability;  
porosity; analysis; statistical analysis; west  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

824444 77-06987

**Aufbau der Salzgesteine des Salzstöckes Etsel abgeleitet aus Kernuntersuchungen und Loginterpretation**  
**Structure of the Etsel salt dome derived from cores and logs**

Hentschel, J.; Kleinlitz, G. W. 1975-1976: Vortraege der Erdöl Kohle; Ergaenzungsband 185-206p.. 1975  
3. DGMK-Fachgruppentagung.

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: German Summary Languages: English

illus.: sketch map  
Descriptors: \*engineering geology; \*Germany; materials; properties; salt; salt domes; solubility; composition; methods; cores; well-logging; analysis; salt tectonics; statistical analysis; applications; reservoirs; subsurface; petroleum; gas storage; Europe; northwest; Wilhelmshaven; Etsel Dome; Lower Saxony

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

823976 77-06790

**Regional flood maxima**

Carrigan, P. H.  
Colorado State; Fort Collins

81p.. 1975

Subfile: B

Degree Level: Doctoral

Doc Type: THESES Bibliographic Level: MONOGRAPHIC

Languages: English

Dis. Abstr. Int., Vol. 36, No. 12, Part 1, p. 62998, 1976.  
Descriptors: \*hydrology; \*automatic data processing; \*engineering geology; rivers and streams; hydrogeology; methods; floods; magnitude; frequency; statistical methods; simulation; computers; models; mathematical models  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

823813 77-07053

**Geomechanical evaluation of the mesotectonic features of the Koteswar Dam site. U. P. and their applications to the calculation of mountain pressures**

Nerrula, P. N.; Shome, S. K.  
J. Eng. Geol. 6 2: Symposium on rock mechanics: Section VIII, 399-408p., 1971

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus.  
Descriptors: \*India; \*fractures; \*foliation; \*structural analysis; \*tectonics; \*engineering geology; structural geology; \*style; interpretation; structure; dams;

lineation: north; Uttar Pradesh; Koteswar Dam; joints; genesis; stress; statistical analysis; cleavage; faults; fracture zones; applications; site exploration; bedrock; phyllite

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

821976 77-03151

**Preliminary empirical model for scaling Fourier amplitude spectra of strong ground acceleration in terms of earthquake magnitude, source-to-station distance, and recording site conditions**

Trifunac, M. D.  
Calif. Inst. Technol., Earthquake Eng. Res. Lab., Pasadena, Calif., USA

Seismol. Soc. Am., Bull. 66: 4, 1343-1373p., 1976

CODEN: BSSAAP

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus.: tables

Descriptors: \*engineering geology; earthquakes; amplitude; acceleration; strong motion; models; statistical analysis; Fourier analysis; regression analysis; magnitude; distance; epicenters; lithology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

821973 77-03006

**A stochastic approach to soil amplification**

Faccioli, E.

Seismol. Soc. Am., Bull. 66: 4, 1277-1291p., 1976

CODEN: BSSAAP

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus.: tables

Descriptors: \*engineering geology; earthquakes; amplification; soils; ground motion; statistical analysis; stochastic processes; soil mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

819724 77-02971  
**Some comments on the association between saturated hydraulic conductivity and texture of Holderness boulder clay**  
 Bonnell, M.  
 Catena 3: 1, 77-90p., 1976  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., tables, sketch map  
 Descriptors: \*engineering geology; \*England; materials; properties; glacial drift; clays; textures; grain size; effects; hydraulic conductivity; statistical analysis; Europe; Holderness; northens; Yorkshire  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

818996 76-45142  
**Retrospection and prognosis of landslide calamities**  
 Spurel, M.  
 Cas. Mineral. Geol. 19: 2, 119-134p., 1974  
 CODEN: CAPMAX  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Czech  
 illus., tables  
 Descriptors: \*Europe; \*engineering geology; \*planetology; geologic hazards; concepts; landslides; 1740-1970; frequency; statistical studies; cycles; relation; solar activity; planets; revolution; shape; elongation; interpretation; prediction; 1966-1996; Mercury Planet; Venus; Mars; Jupiter; Saturn; effects; Earth  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

818075 76-44321  
**Ein Beitrag zur statistischen Klufuntersuchung**  
**Statistical analysis of joints**  
 Bock, H.  
 Festschrift; Leopold Mueller-Salzburg zum 85. Geburtstag  
 Fecker, E. (EDITOR); Gotz, H.-P. (EDITOR); Sauer, G. (EDITOR); Spain, G. (EDITOR)  
 Publ.: Privately published  
 99-111p., 1974  
 Subfile: B  
 Country of Publ.: Germany, Federal Republic of  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: German Summary Languages: English  
 illus.  
 Descriptors: \*engineering geology; rock mechanics; fractures; joints; methods; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

818592 76-44838  
**Percolation tests for septic tank suitability in southern Arizona soils**  
 Barbarick, K. A.; Warrick, A. W.; Post, D. F.; Colo. State Univ., Fort Collins, Colo., USA; Univ. Ariz., Tucson, Ariz., United States  
 J. Soil Water Conserv. 31: 3, 110-112p., 1976  
 CODEN: JSMCAJ  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Ariz. Agric. Exp. Pap. No. 249b, illus., tables  
 Descriptors: \*Arizona; \*engineering geology; site exploration; south; waste disposal; septic tanks; soils; parameters; relations; percolation; rates; methods; statistical analysis; United States  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

813797 76-40043  
**Matrix-arithmetical relations in the dimensioning of dams and in the study of the operation of large lakes**  
 Zsuffa, I.  
 Inventory control and water storage  
 Prekopa, A. (EDITOR)  
 Publ.: North Holland Pub. Co.  
 361-382p., 1973  
 Subfile: B  
 Country of Publ.: Netherlands  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*engineering geology; dams; dimensioning; storage; lakes; management; mathematical methods; matrices; probability  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

818996 76-45142  
**Retrospection and prognosis of landslide calamities**  
 Spurel, M.  
 Cas. Mineral. Geol. 19: 2, 119-134p., 1974  
 CODEN: CAPMAX  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Czech  
 illus., tables  
 Descriptors: \*Europe; \*engineering geology; \*planetology; geologic hazards; concepts; landslides; 1740-1970; frequency; statistical studies; cycles; relation; solar activity; planets; revolution; shape; elongation; interpretation; prediction; 1966-1996; Mercury Planet; Venus; Mars; Jupiter; Saturn; effects; Earth  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 813356 76-39602  
**Landslide inventory in northern Calabria, southern Italy**  
 Carrara, A.; Merenda, L.  
 Geol. Soc. Am. Bull. 87: 8, 1153-1162p., 1976  
 CODEN: BUCMAT  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: geol. sketch map  
 Descriptors: Italy; environmental geology; engineering geology; geologic hazards; slope stability; landslides; south; Calabria; data; statistical analysis; inventory; mapping; applications; land use; soils; conservation; Europe  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 813332 76-39578  
**Investigation and stability analysis of earth slopes**  
 Klengel, K. J.; Schmidt, M.  
 Int. Assoc. Eng. Geol., Bull. 9, 57-61p., 1974  
 CODEN: BIFR86  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus.  
 Descriptors: engineering geology; slope stability; methods; statistical analysis; errors  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 812629 76-38875  
**Matematiko-statisticheskoye sopostavleniye granulometricheskogo sostava i predelov konsistentii lessovykh porod rayona Uratyube**  
**Statistical correlation of grain size and consistency classes of loess in the Uratyube area**  
 Chukhvaize, G. Z.; Bayman, E. N. 1974  
 Uzb. Geol. Zh. 5, 44-46p., 1974  
 CODEN: UZGZAO  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Russian Summary Languages: Uzbekistan  
 Descriptors: USSR; engineering geology; materials; properties; loess; Uzbekistan; Uratyube; sediments; grains; size; consistency; statistical studies; correlation coefficient  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- Invited contributions  
 Esteva, L.; Ingles, O. G.; Morse, R. K.  
**Statistics and probability in civil engineering**  
 Lumh, P. (EDITOR)  
 Publ.: Hong Kong Univ. Press  
 661-675p., 1972  
 Subfile: B  
 Country of Publ.: Hong Kong  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: Introductory and closing remarks. illus.  
 Descriptors: engineering geology; soil mechanics; applications; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 809992 76-36238  
**Estimation of dynamic properties of structures and soils**  
 Vanmarcke, E.; Dobry, R.; Wandra, G.  
 Mass. Inst. Technol., Camb., Mass., USA  
**Statistics and probability in civil engineering**  
 Lumh, P. (EDITOR)  
 Publ.: Hong Kong Univ. Press  
 639-660p., 1972  
 Subfile: B  
 Country of Publ.: Hong Kong  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.: tables  
 Descriptors: engineering geology; materials; properties; soils; structures; motion; damping; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809991 76-36237

**Ocean wave force spectra**  
Tung, C. C.; Hwang, N. E.  
N.C. State Univ., Raleigh, N. C. USA

**Statistics and probability in civil engineering**

Lumb, P. (EDITOR)  
Publ.: Hong Kong Univ. Press  
619-637p., 1972

Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*engineering geology; \*marine installations;  
design; ocean waves; strength; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809920 76-36236

**Artificial earthquake records of prescribed magnitude and focal distance**  
Solnes, J.

**Statistics and probability in civil engineering**

Lumb, P. (EDITOR)  
Publ.: Hong Kong Univ. Press  
599-618p., 1972

Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*engineering geology; \*earthquakes;  
magnitude; ground motion; prediction; experimental studies;  
mathematical models; applications; buildings; construction  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809989 76-36235

**Application of stochastic processes to partially saturated soils**  
Koerner, R. M.

Drexel Univ., Dep. Civil Eng., Phila., Pa., USA

**Statistics and probability in civil engineering**

Lumb, P. (EDITOR)  
Publ.: Hong Kong Univ. Press  
557-568p., 1972

Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: \*engineering geology; \*soils; \*soil mechanics;  
engineering properties; partially saturated; statistical  
analysis; stochastic methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809988 76-36234

**A stochastic approach to the seismic liquefaction problem**  
Donovan, N. C.

Dames & Moore, San Franc., Calif., USA

**Statistics and probability in civil engineering**

Lumb, P. (EDITOR)  
Publ.: Hong Kong Univ. Press  
513-535p., 1972

Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: \*engineering geology; \*soils; \*earthquakes;  
engineering properties; effects; liquefaction;  
cohesionless; statistical analysis; stochastic methods;  
cohesion; loading  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809987 76-36233

**How reliable is the factor of safety in foundation engineering?**

Singh, A.  
Univ. Calif., Dep. Civil Eng., Los Ang., Calif., USA

**Statistics and probability in civil engineering**

Lumb, P. (EDITOR)  
Publ.: Hong Kong Univ. Press  
389-424p., 1972

Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus., tabs  
Descriptors: \*engineering geology; \*foundations; \*design;  
safety factor; reliability; soil mechanics; statistical  
analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809986 76-36232  
Frequency distributions and correlations of soil properties  
Schultze, E.

Statistics and probability in civil engineering  
Lumb, P. (EDITOR)  
Publ: Hong Kong Univ. Press  
371-387p., 1972  
Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: \*engineering geology; \*soils ; soil mechanics;  
engineering properties ; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809985 76-36231  
A probabilistic approach to the correction of soil strength  
Nelson, J. D.; Brand, E. W.; Moh, Z.-C.

Statistics and probability in civil engineering  
Lumb, P. (EDITOR)  
Publ: Hong Kong Univ. Press  
357-370p., 1972  
Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: \*engineering geology; \*soils ; soil mechanics;  
engineering properties ; strength; testing; statistical  
analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809984 76-36230  
The importance of proper soil units for statistical analysis  
Morse, R. K.

Statistics and probability in civil engineering  
Lumb, P. (EDITOR)  
Publ: Hong Kong Univ. Press  
347-355p., 1972  
Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
table  
Descriptors: \*engineering geology; \*soils ; soil mechanics;  
engineering properties ; testing; importance;  
classification; applications; statistical analysis

809983 76-36229  
Precision and accuracy of soil tests  
Lumb, P.

Statistics and probability in civil engineering  
Lumb, P. (EDITOR)  
Publ: Hong Kong Univ. Press  
329-345p., 1972  
Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables  
Descriptors: \*engineering geology; \*soils ; soil mechanics;  
engineering properties ; testing; accuracy; precision;  
statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809982 76-36228  
Statistical analysis of undrained strength of soft Bangkok  
clay  
Ladd, C. C.; Moh, Z.-C.; Gifford, D. G.  
Mass. Inst. Technol., Camb., Mass., USA; Haley & Aldrick,  
Inc., United States

Statistics and probability in civil engineering  
Lumb, P. (EDITOR)  
Publ: Hong Kong Univ. Press  
313-328p., 1972  
Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables, sketch map  
Descriptors: \*Thailand; \*engineering geology; \*soils ;  
materials; properties; engineering properties; Bangkok;  
clays; undrained; strength; statistical analysis; Asia  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 809981 76-36227  
**Estimation of the mean for soil properties**  
 Kay, J. N.; Krizek, R. J.  
 Northwest. Univ., Dep. Civil Eng., Evanston, Ill., USA
- 809978 76-36224  
**Statistical geotechnical properties of glacial Lake Edmonton sediments**  
 Fredlund, D. G.; Dahiman, A. E.  
 R.W. Hardy & Assoc., Vancouver, B.C., CAN
- 809980 76-36226  
**Statistical control in pavement design**  
 Ingles, D. G.
- 809979 76-36225  
**Statistical evaluation of soils test data**  
 Holtz, R. D.; Krizek, R. J.
- 809982 76-36228  
**Statistical analysis of soil properties**  
 Lumb, P. (EDITOR)  
 Publi.: Hong Kong Univ. Press  
 187-202p., 1972  
 Country of Publi.: Hong Kong  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; statistical analysis; mean; estimation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 809977 76-36223  
**Reliability analysis and design of braced excavation systems**  
 Tang, W. H.; Yuceaman, M. S.; Ang, A. H-S  
 Univ. Ill., Dep. Civil Eng., Urbana, Ill., USA
- 809979 76-36225  
**Statistical evaluation of soils test data**  
 Holtz, R. D.; Krizek, R. J.
- 809982 76-36228  
**Statistical analysis of soil properties**  
 Lumb, P. (EDITOR)  
 Publi.: Hong Kong Univ. Press  
 187-202p., 1972  
 Country of Publi.: Hong Kong  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; plasticity; strength; compaction; statistical analysis; applications; design; pavements  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 809978 76-36224  
**Statistical geotechnical properties of glacial Lake Edmonton sediments**  
 Fredlund, D. G.; Dahiman, A. E.  
 R.W. Hardy & Assoc., Vancouver, B.C., CAN
- 809980 76-36226  
**Statistical control in pavement design**  
 Ingles, D. G.
- 809977 76-36223  
**Reliability analysis and design of braced excavation systems**  
 Tang, W. H.; Yuceaman, M. S.; Ang, A. H-S  
 Univ. Ill., Dep. Civil Eng., Urbana, Ill., USA
- 809982 76-36228  
**Statistical analysis of soil properties**  
 Lumb, P. (EDITOR)  
 Publi.: Hong Kong Univ. Press  
 187-202p., 1972  
 Country of Publi.: Hong Kong  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; engineering properties; south-central; Lake Edmonton; sediments; glacial; statistical analysis; applications; soil mechanics; Canada  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 809979 76-36225  
**Statistical evaluation of soils test data**  
 Holtz, R. D.; Krizek, R. J.
- 809982 76-36228  
**Statistical analysis of soil properties**  
 Lumb, P. (EDITOR)  
 Publi.: Hong Kong Univ. Press  
 187-202p., 1972  
 Country of Publi.: Hong Kong  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*engineering geology; \*soils; foundations; engineering properties; excavations; design; statistical analysis; soil mechanics; uncertainty; applications  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 809976 76-36222  
**A Bayesian evaluation of information for foundation engineering design**  
Tang, W. H.  
Univ. Ill., Civil Eng., Urbana, Ill., USA
- Statistics and probability in civil engineering**  
Lumb, P. (EDITOR)  
Publ. Hong Kong Univ. Press  
173-185p., 1972  
Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: \*engineering geology; \*soils; foundations; engineering properties; design; applications; soil mechanics; statistical methods; Bayesian; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 809975 76-36221  
**Risk design of stiffened mats on clay**  
Lytton, R. L.  
Tex. A & M Univ., Dep. Civil Eng., College Station, Tex., USA
- Statistics and probability in civil engineering**  
Lumb, P. (EDITOR)  
Publ. Hong Kong Univ. Press  
153-171p., 1972  
Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: \*engineering geology; \*soils; foundations; engineering properties; mat foundations; design; applications; statistical methods; soil mechanics; clays; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 809974 76-36220  
**Probability and economical foundations**  
Costello, J. F.; Laguros, J. G.  
Univ. Okla., Norman, Okla., USA
- Statistics and probability in civil engineering**  
Lumb, P. (EDITOR)  
Publ. Hong Kong Univ. Press  
145-152p., 1972
- 809973 76-36219  
**First-order uncertainty analysis of soils deformation and stability**  
Cornell, C. A.  
Mass. Inst. Technol., Dep. Civil Eng., Camb., Mass., USA
- Statistics and probability in civil engineering**  
Lumb, P. (EDITOR)  
Publ. Hong Kong Univ. Press  
129-144p., 1972  
Subfile: B  
Country of Publ.: Hong Kong  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; deformation; stability; foundations; embankments; applications; statistical methods; uncertainty; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809972 76-36218

**Statistics and probability in civil engineering**

Lumb, P (EDITOR)  
First International conference on applications of  
statistics and probability to soil and structural engineering  
HKG., Sept. 13-16, 1971

Publ. Hong Kong Univ. Press

675p., 1972

Subfile: B

Country of Publ.: Hong Kong

Doc Type: BOOK: CONFERENCE PUBLICATION Bibliographic  
Level: MONOGRAPHIC

Language: English

Note: Individual papers within scope of this Bibliography  
are cited under the separate authors, illus., tables

Descriptors: \*symposia; engineering geology; soil  
mechanics; applications; statistical methods; Hong Kong;  
1971

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

809115 76-35361

**Errors in strike and dip measurements**

Cruden, D. M.; Charlesworth, H. A. K.

Geol. Soc. Am., Bull., 87, 7, 977-980p., 1976

CODEN: RUGMAF

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Language: English

illus., tables

Descriptors: \*structural geology; engineering geology;  
mathematical analysis; methods; rock mechanics;  
mathematical methods; statistical methods; strike; dip;  
orientation; measurement; errors; field studies; faults;  
fractures; joints; bedding; applications; slope stability;  
examples; North America; Rocky Mountains; Canada

Section Headings: 16 (STRUCTURAL GEOLOGY)

806464 76-32710

**Analiz pokazateley fizicheskogo sosoyaniya i prochnosti  
lessovykh gruntov territorii Tashkenta metodom matematsicheskoy  
statistiki**

Statistical analysis of indices of physical consistency and  
permeability of loess in Tashkent

Danilov, E. A., 2, 59-63p., 1974

Uzb. Geol. Zh., 1974

CODEN: UZGZAO

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Language: Russian Summary Languages: Uzbekistan

tables

Descriptors: \*USSR; engineering geology; materials;

properties; Uzbekistan; Tashkent; loess; statistical  
studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

806431 76-32677

**Analiz nekotorykh pokazateley svoystv prolyuvial'nykh  
lessovykh porod Karshinskoy stepi metodom matematsicheskoy  
statistiki**

Statistical analysis of some indices of properties of  
proluvial loesses in the Karshi Steppe

Isamatov, Yu. P.

Uzb. Geol. Zh., 1, 55-58p., 1974

CODEN: UZGZAO

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Language: Russian Summary Languages: Uzbekistan

illus., table

Descriptors: \*sediments; \*USSR; engineering geology;  
clastics; terrigenous; materials; properties; loess;  
physical properties; Quaternary; Uzbekistan; Karshi Steppe;  
porosity; statistical studies

Section Headings: 24 (SURFICIAL GEOLOGY, QUATERNARY GEOLOGY)

805826 76-32072

**Response of soil-pile systems to seismic waves**

Nair, G. P.

McNister

unpaginatedp., 1975

Subfile: B

Degree Level: Doctoral

Doc Type: THESIS Bibliographic Level: MONOGRAPHIC

Language: English

Diss. Abstr. Int., Vol. 36, No. 9, p. 4613B, 1976.

Descriptors: engineering geology; foundations; piles;  
soils; systems; elastic waves; propagation; earthquakes;  
ground motion; statistical analysis; finite element analysis

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

805708 76-31954

Economic revetments for protecting the banks of Maric and Ergene rivers flood canals against wave erosion  
Bursalı, S.

Sediment transportation

International symposium on river mechanics; proceedings  
Publ: UNESCO, Int. Assoc. Hydrol. Sci., Asian Inst. Technol.  
1. 203-212p., 1973

Ed. 4

Subfile: B  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English

Descriptors: \*Turkey; \*engineering geology; \*experimental studies; Maritsa River; Ergene River; revetments; models; statistical analysis; wave erosion; flood channels; Middle East  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

804656 76-30902

Site-dependent spectra for earthquake-resistant design

Seed, H. B.; Ugas, C.; Lysmer, J.  
Univ. Calif., Dep. Civ. Eng., Berkeley, Calif., USA  
Seismol. Soc. Am., Bull. 66: 1. 221-243p., 1976

CODEN: BSSAAP

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: tables

Descriptors: \*engineering geology; \*United States; earthquakes; buildings; design; ground motion; spectra; acceleration; dependence; soils; depth; physical properties; statistical methods; west  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

803831 76-30077

Foundation analysis of Auburn damsite

Christiansen, L. M.; Misterek, D. L.; Sowles, G. F.  
U. S. Dep. Inter., Denver, Colo., USA

Rock fracture; Vol. 1

Anonymous  
Publ: Int. Soc. Rock Mech.  
unpaginatedp., 1971  
Subfile: B

Country of Publ.: France  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.

Descriptors: \*California; \*engineering geology; dams; foundations; rock mechanics; Sacramento; American River; Auburn Dam; site exploration; stability; loading; modulus; deformation; statistical methods; finite element analysis; United States  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

803828 76-30074

Deformation moduli determined by joint-shear index and shear catalog

Von Thun, J. L.; Tarbox, G. S.  
U. S. Dep. Inter., Denver, Colo., USA

Rock fracture; Vol. 1

Anonymous  
Publ: Int. Soc. Rock Mech.  
unpaginatedp., 1971  
Subfile: B

Country of Publ.: France  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.: table

Descriptors: \*engineering geology; \*California; rock mechanics; deformation; modulus; joints; fractures; shear; statistical methods; joint-shear index; applications; dams; foundations; United States; Auburn Dam  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

803814 76-30060

Three dimensional analysis of jointed rock slopes  
St. John, C. M.

Rock fracture; Vol. 1

Anonymous  
Publ: Int. Soc. Rock Mech.  
unpaginatedp., 1971  
Subfile: B

Country of Publ.: France  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.

Descriptors: \*engineering geology; slope stability; joints; statistical methods; finite element analysis; three-dimensional; deformability; wedges  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

803812 76-30058  
La methode des elements finis, appliquee a la mecanique de la fracture  
The finite element method applied to fracture mechanics  
Winer, P.  
illus., tables  
Descriptors: engineering geology; rock mechanics; joints; tension; experimental studies; shear strength; roughness; dilation; stress; methods; statistical methods; applications; slope stability  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

803284 76-29530  
Stochastic simulation of earthquakes  
Lou, V.-S.  
Pennsylvania  
271P, 1975  
Subfile: B  
Degree Level: Doctoral  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Int., Vol. 36, No. 5, p. 2382B-2383B, 1975.  
Descriptors: engineering geology; earthquakes; simulation; statistical methods; stochastic processes; models; mathematical models; applications; design; criteria; construction  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

802295 76-28541  
Use of quasi-static friction cone penetrometer data to predict load capacity of displacement piles  
Nottingham, L. C.  
Florida  
567p., 1975  
Subfile: B  
Degree Level: Doctoral  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Int., Vol. 36, No. 8, p. 4092B-4093B, 1976.  
Descriptors: engineering geology; foundations; piles; loading; capacity; prediction; techniques; penetrometers; cones; data; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

803811 76-30057  
Stress distribution in direct shear test samples  
Kutter, H. K.  
Rock fracture; Vol. 1  
Anonymous  
Publ. Int. Soc. Rock Mech.  
unpaginated., 1971  
Subfile: B  
Country of Publ.: France  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: French Summary Languages: English  
illus.  
Descriptors: engineering geology; rock mechanics; fractures; strength; media; elastic; statistical methods; finite element analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

803792 76-30038  
A relationship between joint roughness and joint shear strength  
Barton, N.  
Rock fracture; Vol. 1  
Anonymous  
Publ. Int. Soc. Rock Mech.  
unpaginated., 1971  
Subfile: B  
Country of Publ.: France  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.  
Descriptors: engineering geology; rock mechanics; stress; distribution; nonuniform; shear plane; statistical methods; finite element analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

803792 76-30038  
A relationship between joint roughness and joint shear strength  
Barton, N.  
Rock fracture; Vol. 1  
Anonymous  
Publ. Int. Soc. Rock Mech.  
unpaginated., 1971  
Subfile: B  
Country of Publ.: France  
Doc Type: BOOK Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French

- 801135 76-27381  
**Délimitation probabiliste des zones de karstification**  
 Statistical delimitation of sinkhole areas  
 Thomas, A.  
 Sink-holes and subsidence; engineering-geological problems related to soluble rocks  
 Wolters, R. (chairperson)  
 Publ: Deutsch. Ges. Erd- und Grundbau  
 TK. 1-TJK. 6p., 1973  
 Subfile: B  
 Country of Publ.: Germany, Federal Republic of  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: French Summary Languages: English  
 illus.  
 Descriptors: \*France; \*engineering geology; land subsidence; northeast; Nancy; site exploration; cavities; sinkholes; subsurface; location; prediction; statistical methods; karst; carbonate rocks; Jurassic; Europe  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 800347 76-26593  
**Methods of investigation in long wall faces**  
 Josien, J. P.  
 Int. J. Rock Mech. Min. Sci. 12: 11. 341-345p., 1975  
 CODEN: IJRM2  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.  
 Descriptors: \*mining geology; \*engineering geology; production control; rock mechanics; coal; subsurface; controls; structural controls; deformation; surveys; methods; statistical methods; practice; Europe; France; mines  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 800209 76-26455  
**Tunnel support loading caused by rock failure**  
 Damsen, J. J. K.  
 Minnesota  
 43p., 1975  
 Subfile: B  
 Degree Level: Doctoral  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 36, No. 6, p. 2943B, 1975.  
 Descriptors: \*engineering geology; tunnels; rock loading; excavations; subsurface; systems; support; failure; statistical analysis; materials; strength
- 799948 76-26194  
**Probabilistic approach to one-dimensional consolidation settlement**  
 El-Moursi, H. E.-D. H.  
 Northwestern  
 197p., 1975  
 Subfile: B  
 Degree Level: Doctoral  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 36, No. 7, p. 3506B, 1976.  
 Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; consolidation; settlement; parameters; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 799944 76-26190  
**Evaluation of in-situ testing methods in soils**  
 Ahmad, N.  
 Louisiana State: Baton Rouge  
 400p., 1975  
 Subfile: B  
 Degree Level: Doctoral  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 36, No. 7, p. 3502B, 1976.  
 Descriptors: \*soils; \*engineering geology; \*engineering properties; soil mechanics; testing; methods; in situ; sampling; techniques; evaluation; statistical analysis; shear strength; experimental studies; field studies; comparison  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

798497 76-24743  
**The probable earthquake or the hundred year seismic event for the Los Angeles region**  
 Robinson, B. A.  
 Los Angeles County Gov., Los Angeles, Calif., USA  
 Assoc. Eng. Geol., Ann. Meet., Program Abstr., 18, 41p., 1975  
 CODEN: CAGPAV  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: California; Los Angeles region; prediction; earthquakes; methods; comparison; statistical analysis; magnitude; United States; San Andreas Fault  
 seismic surveys; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

799311 76-26157  
**A statistical study of Koyna aftershocks for the period January 1968-October 1973**  
 Sharma, H. S. S.; Murty, G. S.  
 Indian J. Meteorol., Hydrol. Geophys., 26: 1, 121-126p., 1975  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: India; engineering geology; earthquakes; Asia; Koyna; 1968-1973; aftershocks; statistical analysis; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

798282 76-24528  
**Some effects of repeated triaxial stresses on road pavement materials**  
 Shackel, B.  
 New South Wales  
 unpaginatedp., 1974  
 Subfile: B  
 Degree Level: Doctoral  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 36, No. 2, p. 839B-840R, 1975.  
 Descriptors: engineering geology; soils; highways; engineering properties; soil mechanics; behavior; loading; stress; compression; triaxial; review; experimental studies; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

799306 76-25552  
**A study of two braced excavations in sands and interbedded stiff clay**  
 O'Rourke, T. D.  
 Illinois Urbana  
 273p., 1975  
 Subfile: B  
 Degree Level: Doctoral  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 36, No. 5, p. 23R3B, 1975.  
 Descriptors: District of Columbia; engineering geology; soils; soil mechanics; engineering properties; Metro; excavations; sand; clays; stress; displacements; statistical analysis; experimental studies; field studies; construction; subways; United States  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

799282 76-25528  
**The relationship between littoral drift rate and the longshore component of wave energy flux**  
 Watson, R. L.  
 Texas Austin  
 119p., 1975  
 Subfile: B  
 Degree Level: Doctoral  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 36, No. 5, p. 2124B, 1975.  
 Descriptors: engineering geology; sedimentation; marine geology; shorelines; transport; Gulf of Mexico; littoral; prediction; erosion; statistical analysis; drift; energy; beaches; erosion; tracer experiments; United States; Texas; marine transport; quantitative analysis; ocean waves  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

797591 76-23837  
**Three-dimensional finite element analysis of vertically loaded pile groups**  
 Ottaviani, M. 25: 2, 159-174p., 1975  
 Geotechnique GTNOAB  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illius.  
 Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; settlement; foundations; piles; loading; analysis; methods; mathematical methods; statistical methods; finite element analysis; stress; elasticity  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

796602 76-22848  
**Permeability of unconsolidated and consolidated marine sediments, Gulf of Mexico**  
 Bryant, W. R.; Hottman, W.; Trabant, P.  
 Tex. A&M Univ., Dep. Oceanogr., College Station, Tex., USA  
 Mar. Geotechnology 1: 1, 1-14p., 1975  
 CODEN: MRGTAY  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illius.. tables  
 Descriptors: \*Gulf of Mexico; \*engineering geology; \*marine geology; \*materials; properties; permeability; sediments; marine; regional; prediction; experimental studies; unconsolidated; consolidated; consolidation; statistical analysis; applications; petroleum; samples; dntr  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

799281 76-24527  
**Internal erosion of compacted cohesive soil**  
 Landau, H. G., Jr.  
 Purdue  
 256p., 1974  
 Subfile: B  
 Degree Level: Doctoral  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 36, No. 2, p. 839B, 1975.  
 Descriptors: \*engineering geology; materials; properties; construction materials; soils; clays; erosion; internal; factors; statistical analysis; experimental studies; stabilization  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

799277 76-24523  
**Slope stability problems induced by human modification of the soil covered hill slopes of Oahu, Hawaii**  
 De-Silva, G. L. R.  
 Hawaii  
 471p., 1974  
 Subfile: B  
 Degree Level: Doctoral  
 Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
 Languages: English  
 Diss. Abstr. Int., Vol. 36, No. 2, p. 627B, 1975.  
 Descriptors: \*Hawaii; \*engineering geology; slope stability; landslides; Oahu; problems; factors; man; soils; statistical methods; models; maps; United States  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

797603 76-23849  
**Finite element analysis of the surface deformation due to uniform loading on a layer of Gibson soil resting on a smooth rigid base**  
 Simons, N. E.; Rodrigues, J. S. N.  
 Geotechnique 25: 2, 375-379p., 1975  
 CODEN: GTNOAB  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illius.. table  
 Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; deformation; surface; horizontal; vertical; analysis; methods; statistical methods; finite element analysis; automatic data processing; models; Gibson  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 796600 76-22846  
**Finite difference solution for drainage of heterogeneous sloping lands**  
Natur, F. S.  
Utah State  
18Op. 1974  
Subfile: B  
Degree Level: Doctoral  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Int., Vol. 36, No. 1, p. 369E, 1975.  
Descriptors: \*engineering geology; methods; statistical methods; finite difference; automatic data processing; drainage; slopes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 796169 76-22415  
**Turbulent transfer characteristics of settling phenomenon**  
Pavazit, M.  
Int. Assoc. Hydraul. Res., Congr., Proc., 14, Vol. 1: Transfer problems in liquid flow, 1-8p., 1971  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.  
Descriptors: \*engineering geology; \*sedimentation; experimental studies; deposition; settling basins; design; turbulence; flow; entrance; grids; screens; roughness; Reynolds number; models; probability; methods; anemometry  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 795904 76-22150  
**Probability models of wastewater treatment plant operation**  
Bulkeley, J. W.  
Univ. Mich., Ann Arbor, Mich., USA  
J. Hydrol., 28: 2-4: Control of water resource systems, 317-329p., 1976  
CODEN: JHYDA7  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: \*Michigan; \*engineering geology; \*environmental geology; \*waste disposal; Washtenaw County; Ann Arbor; statistical analysis; models; probability; United States  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 796446 76-22692  
**On the value of information to flood frequency analysis**  
Stack, J. R.; Wallis, J. R.; Matalas, N. C.  
U. S. Geol. Surv., Reston, Va., USA; IBM Thomas J. Watson Res. Cent., United States  
Water Resour. Res., 11: 5, 629-647p., 1975  
CODEN: WRETAQ  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables  
Descriptors: \*engineering geology; \*environmental geology; geologic hazards; floods; occurrence; frequency; distribution; theoretical studies; statistical methods; Monte Carlo  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 796184 76-22430  
**Prognosis of general deformation of natural and artificial alluvial beds composed of non-uniform material**  
Mitschenko, T. E.; Magomedov, A. V.  
Int. Assoc. Hydraul. Res., Congr., Proc., 14, Vol. 3: Changes in alluvial beds composed of non-uniform material, 25-33p., 1971  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus., tables  
Descriptors: \*engineering geology; waterways; rivers; alluvium; pavements; scour; mathematical methods; probability; diameter; grains  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

795902 76-22148  
Optimal operation of the pumping stations in the  
Kinnereth-Eskhol section of the National Water Carrier  
Umeln, E.; Shamir, U.  
Mekoroth Water Co. Ltd., ISR  
J. Hydrol., 78: 2-4; Control of water resource systems,  
271-289p., 1976  
CODEN: JHYDA7  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: Israel; engineering geology; waterways;  
canals; reservoirs; Sea of Galilee; Zalmou Reservoir;  
Eskhol Canal; Jordan Canal; surface; pumping; instruments;  
systems; operation; statistical analysis; models;  
automatic data processing; policy; economics; Middle East  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

795185 76-21431  
A true triaxial apparatus to test rockfills  
Marsal, R. J.  
Int. Conf. Soil Mech. Found. Eng., Proc. 1-2: Methods of  
investigating strength and deformability of soils,  
p., 1977  
CODEN: PCSMB2  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: soils; engineering geology; deformation;  
engineering properties; soil mechanics; experimental studies  
; granular; rockfill; stress; strain; friction;  
resistance; measurement; methods; statistical methods;  
instruments; theoretical studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

795207 76-21453  
The specific constrained modulus  
Stamopoulos, A.; Kotzias, P. C.  
Kotzias-Stamopoulos, Athens, GRC  
Int. Conf. Soil Mech. Found. Eng., Proc. 1-2: Methods of  
investigating strength and deformability of soils,  
p., 1977  
CODEN: PCSMB2  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: soils; engineering geology; engineering  
properties; soil mechanics; compressibility; settlement;  
prediction; constrained modulus; variations; density; dry;  
experimental studies; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

795202 76-21448  
Elastic parameters for soils with cross-anisotropy  
Silveira, A.; Souto Silveira, E. B.  
Pronon Eng. S. A., Brazil  
Int. Conf. Soil Mech. Found. Eng., Proc. 1-2: Methods of  
investigating strength and deformability of soils,  
p., 1977  
CODEN: PCSMB2  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: soils; engineering geology; deformation;  
engineering properties; soil mechanics; theoretical studies

794923 76-21169  
Some empirical relationships between drained friction  
angles, mechanical analyses and Atterberg limits of natural  
soils at Kainji Dam, Nigeria  
Humphreys, J. D.  
Mander, Raikes and Marshall, Bristol, GBR  
Geotechnique 25: 3, 581-585p., 1975  
CODEN: GINQJ8  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: Nigeria; engineering geology; soils; dams;  
engineering properties; soil mechanics; Kainji Dam;  
rockfill; earthfill; shear strength; plasticity;  
plasticity index; Atterberg limits; statistical analysis;  
Africa  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

795207 76-21453  
The specific constrained modulus  
Stamopoulos, A.; Kotzias, P. C.  
Kotzias-Stamopoulos, Athens, GRC  
Int. Conf. Soil Mech. Found. Eng., Proc. 1-2: Methods of  
investigating strength and deformability of soils,  
p., 1977  
CODEN: PCSMB2  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: soils; engineering geology; engineering  
properties; soil mechanics; compressibility; settlement;  
prediction; constrained modulus; variations; density; dry;  
experimental studies; statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

795202 76-21448  
Elastic parameters for soils with cross-anisotropy  
Silveira, A.; Souto Silveira, E. B.  
Pronon Eng. S. A., Brazil  
Int. Conf. Soil Mech. Found. Eng., Proc. 1-2: Methods of  
investigating strength and deformability of soils,  
p., 1977  
CODEN: PCSMB2  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: soils; engineering geology; deformation;  
engineering properties; soil mechanics; theoretical studies

794329 76-20575

**Stochastic structure of the turbulent boundary shear stress process**

Blinn, P. H.; Malinow, K.; Simons, D. B.  
 U. S. Dep. Agric. Agric. Res. Serv., Fort Collins, Colo.,  
 USA; Colo. State Univ., United States  
 Int. Assoc. Hydraul. Res., Congr., Proc. 15, Vol. 1: Flow in  
 channels with loose boundaries, 371-380p., 1973  
 Subfile B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus., tables  
 Descriptors: \*engineering geology; waterways; channels;  
 processes; boundary; stress; shear; distribution; models  
 ; stochastic; statistical methods; experimental studies  
 ; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

794318 76-20564

**Investigation and forecast of sediment motion, from position of reliability and probability theories**

Mirtskhulava, T. Ye.; Magomedova, A. V.; Mikhailovna, M. A.;  
 Arkhangel'skiy, M. M.; Verbitskiy, V. S.  
 Int. Assoc. Hydraul. Res., Congr., Proc. 15, Vol. 1: Flow in  
 channels with loose boundaries, 261-270p., 1973  
 Subfile B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus  
 Descriptors: \*engineering geology; waterways; erosion;  
 sedimentation; experimental studies; Mirtskhulava, T. E.;  
 Mikhailovna, M. A.; Arkhangel'skiy, M. M.; Verbitskiy, V. S.  
 ; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

794321 76-19869

**Stochastic approach at the calculation of bed-load discharge in alluvial watercourses**

Bozinovic, M.  
 Int. Assoc. Hydraul. Res., Congr., Proc. 15, Vol. 5,  
 35-38p., 1973  
 Subfile B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus  
 Descriptors: \*sedimentation; \*engineering geology;  
 transport; waterways; stream transport; bed load;  
 calculation; methods; statistical methods; theoretical  
 studies  
 ; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

793622 76-19868

**Stochastic methods for motion of suspended grains**

Bayazit, M.  
 Int. Assoc. Hydraul. Res., Congr., Proc. 15, Vol. 5,  
 31-34p., 1973  
 Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Descriptors: \*sedimentation; \*engineering geology;  
 transport; waterways; stream transport; sediments;  
 suspended; experimental studies; channels; flumes; flow;  
 turbulence; methods; statistical methods; models;  
 stochastic

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

793270 76-19516

**Seismic risk in Italy for earthquakes of intensity IX (Mercalli scale)**

Iaccarino, E.  
 Tectonophysics 30: 3-4, 261-167p., 1976  
 CODEN: TCTOAM  
 Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table, sketch map  
 Descriptors: \*Italy; \*seismology; \*earthquakes; \*engineering  
 geology; seismicity; Europe; volcanology; regional;  
 possibilities; statistical analysis; epcenters;  
 attenuation; seismic risk; occurrence; magnitude  
 ; Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

792313 76-18559

The effect of alteration the Miocene clays composition upon their colloidal properties  
 Monushko, A. M.; Ponomov, S. I.

International clay conference; abstracts  
 Publ.: Univ. Nac. Auton. Mex., Inst. Geol.  
 198-200p., 1975

Country of Publ.: Mexico  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: English

Descriptors: \*USSR; \*engineering geology; \*weathering; \*clay mineralogy; \*materials; \*properties; \*area studies; \*sediments; \*clays; \*Caucasus; \*effects; \*colloidal properties; \*statistical analysis; \*clay minerals; \*hydromics; \*montmorillonite; \*deposits; \*Miocene; \*clay; \*engineering properties; \*Monushko, A. M.

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

791291 76-17537

Izmenchivost' teplofizicheskikh kharakteristik poverkhnostnogo sloya gruntov  
 Variability of thermal of the surface layer of soils  
 Pavlov, A. V.

Problemy geokriologii

Tsvetkova, S. G. (EDITOR)  
 Publ.: Izd. Nauka, Sib. Otd.  
 64-69p., 1973

Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: BOOK Bibliographic Level: ANALYTIC  
 Languages: Russian

Illustrations: tables  
 Descriptors: \*engineering geology; \*frost action; \*soils; \*loam; \*meadow; \*forests; \*frozen; \*thawed; \*surface layer; \*heat conductivity; \*factors; \*moisture; \*depth; \*experimental studies; \*statistical studies; \*USSR; \*Zaporsk

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

790002 76-16248

Velocity/porosity relationships in limestones from the Portland Group of southern England

Cole, D. I.  
 Geoeexploration 14: 1, 37-50p., 1976  
 CODEN: GEORAV

Country of Publ.: England  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Illustrations: table, sketch map

Descriptors: \*England; \*engineering geology; \*sedimentary rocks; \*geophysical methods; \*seismology; \*materials; \*properties; \*elastic waves; \*carbonate rocks; \*seismic methods; \*limestone; \*elastic properties; \*porosity; \*velocity; \*experimental studies; \*statistical methods; \*data; \*sparite; \*micrite; \*microsparite; \*chalk; \*textures; \*cement; \*grains; \*size; \*classification; \*types; \*Jurassic; \*Portlandian; \*Europe; \*south

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

789582 76-15828

Engineering properties and slope form in granular soils

Rouse, W. C.  
 Eng. Geol. 9: 3, 221-235p., 1975  
 CODEN: EGGQAO  
 Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
 Illustrations: geol. sketch map

Descriptors: \*Wales; \*engineering geology; \*soils; \*materials; \*properties; \*engineering properties; \*sediments; \*slope stability; \*Gleamorgan; \*soil mechanics; \*Europe; \*granular; \*grains; \*size; \*models; \*statistical methods; \*landslides; \*shallow; \*rates; \*applications; \*geomorphology; \*mass movements

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

789558 76-15804

Flood prediction of the Bhagirathi River, West Bengal

Ghosh, A.  
 Indian Geohydro. 9: 2, 94-101p., 1973  
 CODEN: IGHYB2  
 Subfile: B

Country of Publ.: India

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
 Tables

Descriptors: \*engineering geology; \*India; \*geologic hazards; \*floods; \*prediction; \*statistical methods; \*stochastic; \*frequency; \*autoregression; \*Asia; \*Bhagirathi River; \*West Bengal

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

788837 76 15083

**Examples of evaluating the results from sounding tests**

Schultze, E.  
**Proceedings of the European symposium on penetration testing; Vol. 2; Part 2, Papers**  
 Brons, B. B. (Chairperson)  
 Publ. Natl. Swed. Build. Res.  
 353-359p. 1975  
 Subfile B

Country of Publ.: Sweden  
 Doc Type: BOOK Bibliographic Level: ANALYTIC

Languages: English  
 illus., tables  
 Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; cohesionless; sand; silt; penetration testing; evaluation; statistical analysis; foundations; methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

787363 76-13609

**Comparison of relative densities estimated using different approaches**

Bell, R. A.; Singh, J. P.  
 James & Moore, San Franc., Calif., USA  
 Am Soc. Test. Mater., Spec. Tech. Publ. 523: Relative density, geotechnical projects, cohesionless soils. 455-462 p. 1973

CODEN: ASTTAB  
 Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table  
 Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; cohesionless; density; relative density; measurement; methods; evaluation; experimental studies; field studies; correla. in; data; statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

787361 76-13607

**Field and laboratory determination of maximum density in coarse sands and gravels for Mica Dam**

Law, W. I.; Seiver, C.  
 CASECO Consult., Mica Dam, Mica Creek, B.C., CAN  
 Am. Soc. Test. Mater., Spec. Tech. Publ. 523: Relative density, geotechnical projects, cohesionless soils. 425-443 p. 1973

CODEN: ASTTAB  
 Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English

illus., tables  
 Descriptors: \*British Columbia; \*engineering geology; \*soils mechanics; engineering properties; dams; Mica Dam; cohesionless; density; relative density; experimental studies; field studies; tests; compaction; data; statistical analysis; earth dams; earth-fill; sand; gravel; materials; quality control; construction; Canada  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

787340 76-13586

**Effect of variations in minimum density on relative density**

Gupta, R. C.; McKeoun, J. D.  
 Am. Soc. Test. Mater., Spec. Tech. Publ. 523: Relative density, geotechnical projects, cohesionless soils. 85-97p. 1973

CODEN: ASTTAB

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
 illus., tables  
 Descriptors: \*soils; \*engineering geology; engineering properties; soil mechanics; cohesionless; relative density; minimum density; variations; effects; tests; compaction; data; statistical analysis; construction; controls; Manitoba; Kettle Generating Station; density; experimental studies; Canada; Gilliam  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

787339 76-13585

**Statistical significance of the relative density**

Yoshimi, Y.; Tohno, I.  
 Am. Soc. Test. Mater., Spec. Tech. Publ. 523: Relative density, geotechnical projects, cohesionless soils. 74 84p. 1973

CODEN: ASTTAB

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC

Languages: English  
 illus., tables  
 Descriptors: \*engineering geology; \*soils; soil mechanics; engineering properties; cohesionless; density; relative density; measurement; tests; errors; statistical analysis; data  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

787338 76-13584

**Variability of laboratory relative density test results**

Friedmann, D. A.  
 Bur. Reclam., Eng. Res. Cent., Denver, Colo., USA  
 Am. Soc. Test. Mater., Spec. Tech. Publ. 523: Relative  
 density, geotechnical projects, cohesionless soils, 61-73p.,  
 1973

CODEN: ASTTAB  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*engineering geology; \*soils ; soil mechanics;  
 engineering properties ; cohesionless; density; relative  
 density; measurement; tests; compaction; variations;  
 accuracy; reproducibility; data; statistical analysis;  
 laboratories; United States; Bureau of Reclamation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

787337 76-13583

**Accuracy of relative density measurements: results of a comparative test program**

Tavenas, F.; Ladd, R. S.; La Rochelle, P.  
 Woodward-Moorhouse & Assoc., Inc., Clifton, N.J., United  
 States  
 Am. Soc. Test. Mater., Spec. Tech. Publ. 523: Relative  
 density, geotechnical projects, cohesionless soils, 18-60p.,  
 1973

CODEN: ASTTAB  
 Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*engineering geology; \*soils ; soil mechanics;  
 engineering properties ; cohesionless; density; relative  
 density; measurement; tests; compaction; variations;  
 accuracy; data; statistical analysis; programs; American  
 Society for Testing and Materials  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

785429 76-11675

**Probabilistic aspects of slope stability**

Lumb, P.  
 Univ. Hong Kong, HKG  
 Int. Symp. Landslide Control, Proc. 1, 125-131p., 1977  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 Note: With discussion.  
 Descriptors: \*engineering geology ; slope stability ;

analysis; statistical methods; strength; failure; design;  
 probability  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

785329 76-11575

**Probability of failure and expected volume of failure in high rock slopes**

McMahon, B. K.  
 Aust. Rock Eng. Consult., AUS  
 Aust.-N.Z. Conf. Geomech., Proc. 2, 308-313p., 1975  
 CODEN: PAZCAQ

Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., table  
 Descriptors: \*engineering geology ; slope stability ;  
 failure; probability; estimation; methods; mathematical  
 methods; slopes; long; excavations; time; open-pit mining  
 ; mining geology  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

785298 76-11544

**Presentation of fracture data for rock mechanics**

Bridges, M. C.  
 Mt. Isa Mines Ltd., AUS  
 Aust.-N.Z. Conf. Geomech., Proc. 2, 144-148p., 1975  
 CODEN: PAZCAQ

Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., tables  
 Descriptors: \*structural analysis; \*fractures; \*engineering  
 geology ; interpretation; patterns; rock mechanics ;  
 mathematical models; presentation; tables; diagrams;  
 statistical methods; automatic data processing; orientation;  
 nomenclature; models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

785297 76-11543

**An analysis of size effect behaviour in brittle rock**

Brown, E. T.; Gohano, L. P.  
Aust.-N.Z. Conf. Geomech., Proc. 2, 139-143p., 1975

CODEN: PAZCAQ

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

illus.  
Descriptors: \*engineering geology ; rock mechanics ; fractures; cracks; propagation; stress; failure; specimens; brittle; size; effects; analysis; theoretical studies; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

783642 76-09888

**Predicted deformation of the upstream membrane of a rockfill dam**

Penman, A. D. M.; Charles, J. A.  
Ground Eng. 8: 6, 47-48p., 1975

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

illus.  
Descriptors: \*England; \*engineering geology ; dams ; Winscar Dam; rockfill; prediction; deformation; mechanism; statistical methods; finite element analysis; rock mechanics; compression; sandstone; Europe  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

785278 76-11524

**A method for the application of soil mechanics to non-homogeneous soils**

McAnally, P. A.  
Ground Test. Progr. Ltd., AUS

Aust.-N.Z. Conf. Geomech., Proc. 2, 26-30p., 1975

CODEN: PAZCAQ

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

illus., tables  
Descriptors: \*engineering geology; \*soils ; soil mechanics; engineering properties ; methods; statistical methods; models; design; parameters; selection; safety; factors; comparison; experimental studies; shear strength; compression; nonhomogeneous  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

783623 76-09869

**Utilizarea analizei teritoriale a sirilor hidrologice pentru determinarea parametrilor hidrologici de proiect cu diverse asigurar**

**Use of territorial analysis of hydrologic sequences to determine probabilities of various hydrologic parameters**

Plataga, Georgehe  
Hidroteh., Gospod. Apelor, Meteorol. 18: 10, 517-524p., 1973

CODEN: HGAMAL

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Romanian Summary Languages: English

illus., tables, sketch map  
Descriptors: \*Romania; \*hydrology; \*engineering geology ; hydrogeology; rivers and streams; waterways ; east; Siret River; Prut River; Europe; discharge; prediction; statistical methods; probability distributions  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

784446 76-10692

**Solution of a free-surface boundary value problem using an inverse formulation and the finite element method**

Sheng, J. C.; Bruch, J. C., Jr.  
Univ. Calif., Dep. Mech. Environ. Eng., USA

J. Hydr. 26: 1-2, 141-152p., 1975

CODEN: JHYDA7

Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English

illus., table  
Descriptors: \*engineering geology ; seepage ; theoretical studies; statistical methods; finite element analysis; automatic data processing; hydrology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

783609 76-09855

**Calculul deformatiilor barajelor din anrocamente**  
**Calculation of deformation on rockfill dams**  
Constantinescu, Alexandru; Comsa, Radu; Otea, Valeriu  
Hidroteh., Gospod. Apelor, Meteorol. 18: 1, 20-23p.,  
1973  
CODEN: HGAMAL  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Romanian Summary Languages: English  
illus., tables  
Descriptors: engineering geology; dams; rockfill;  
deformation; profiles; statistical methods; finite element  
analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

783602 76-09848

**Eforturi si deformatii in baraje din materiale locale**  
**Stress-strain analyses of earth-and-rockfill dams**  
Constantinescu, Alexandru; Comsa, Radu; Otea, Valeriu  
Hidroteh., Gospod. Apelor, Meteorol. 17: 8, 407-416p.,  
1972  
CODEN: HGAMAL  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Romanian Summary Languages: English  
illus., tables  
Descriptors: engineering geology; dams; rockfill;  
earthfill; stress; strain; settlement; statistical methods  
; finite element analysis  
; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

783586 76-09832

**Folosirea functiilor de distributie multidimensionale la**  
**rezolvarea unor probleme de hidrologie si hidraulica a**  
**riurilor**  
**The use of multi-sized distribution functions to solve**  
**problems of river hydrology and hydraulics**  
Hancu, S.  
Hidroteh., Gospod. Apelor, Meteorol. 17: 1, 1-13p.,  
1972  
CODEN: HGAMAL  
Subfile: B  
Country of Publ.: Romania  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Romanian Summary Languages: English  
illus., tables  
Descriptors: hydrology; engineering geology; rivers and  
streams; methods; hydraulics; frequency; floods; water  
levels; maxima; statistical methods; distribution functions  
; multidimensional

782965 76-09211

**A systematic determination of engineering criteria for rock**  
Aufmuth, R. E.  
Assoc. Eng. Geol., Bull. 12: 1, 80-81p., 1975  
CODEN: ENGEAS  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Note: Reply.  
Descriptors: engineering geology; materials; properties  
rocks; criteria; statistical analysis  
; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

782964 76-09210

**A systematic determination of engineering criteria for rock**  
Avolio, G. W.; Clarkson, O. D.  
Assoc. Eng. Geol., Bull. 12: 1, 77-79p., 1975  
CODEN: ENGEAS  
Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Note: Discussion, illus.  
Descriptors: engineering geology; materials; properties  
rocks; criteria; statistical analysis  
; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

782542 76-08788  
 : statistical analysis; mathematical models; homogeneity;  
 permeability; effects; fissures  
 Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

**Determination of joint populations and their significance for tunnel stability**

Robertson, A. MacG.; Piteau, D. R.  
 Frankville S.A. (Pty.) Ltd., Johannesburg, ZAF; Piteau,  
 Gadsby Macleod Ltd., Geotech. Consult., Canada  
 Soc. Min. Eng. AIME, Trans., 254, 135-139p., 1973  
 CODEN: TMENAE

Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English

Descriptors: \*engineering geology; tunnels; slope  
 stability; joints; orientation; continuity; populations;  
 models; field methods; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

782058 76-08304

**Trend surface analysis for geotechnical site planning**

Giardino, S. Jr.; Kuthawy, F. H.  
 Eng. F. Lab., Inc., Phoenix, Ariz., USA; Syracuse Univ.,  
 United States  
 Assoc. Eng. Geol., Bull., 12, 3, 177-192p., 1975  
 CODEN: ENGEA9

Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English

Illus., strat. col., sketch maps  
 Descriptors: \*New York; \*engineering geology; \*automatic  
 data processing; methods; Onondaga County; site  
 exploration; foundations; urban planning; central;  
 Syracuse; statistical methods; trend-surface analysis;  
 strategies; subsurface; units; boundary; experimental  
 studies; field studies; well-logging; United States  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

781784 76-08030

**Alcune considerazioni sulla trattazione matematica del problema del moto in acquiferi fessurati. A mathematical approach to the problem of water movement in fissured aquifers**

Benedini, M.; Giuliano, G.; Troisi, S.  
 Geol. Appl. Idrogeol., 7, 75-100p., 1972  
 CODEN: GAID8G

Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Italian Summary Languages: English  
 Illus.

Descriptors: \*engineering geology; \*ground water;  
 materials; properties; artifers; fractures; hydrodynamics

780373 76-06619

**Probability concepts in earthquake engineering**

Ang, A. H. S.  
 Univ. Illinois, Urbana, Ill., USA  
 Am. Soc. Mech. Eng., Appl. Mech. Div., Appl. Mech. Symp.  
 Ser., B, 229-259p., 1974  
 CODEN: AMDVAS

Subfile: B  
 Country of Publ.: United States  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English

Descriptors: \*engineering geology; earthquakes; concepts  
 probability; ground motion; models; seismic risk  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

779757 76-06003

**Regional evaluation of landslide hazard; a semi-quantitative method**

Kojan, Eugene  
 U. S. Forest Serv., Geotech. Mt. Eng., Pleasant Hill,  
 Calif., USA  
 Geol. Soc. Am., Abstr. Programs 6: 7, 829-830p., 1974  
 CODEN: GAAPBC

Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English

Descriptors: \*engineering geology; slope stability;  
 landslides; prediction; analysis; statistical methods;  
 photogrammetry; mapping  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

779571 76-05817

**Influencia da natureza do solo na segurancia das estruturas aos sismos**  
**Effects of soil conditions on earthquake structural safety**  
 Mineiro, A. J. C.  
 Geotecnica (Agrupamento Port. Mec. Solos Rochas) 1, 49-63  
 p., 1971

Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Portuguese Summary Languages: English  
 illus., table  
 Descriptors: \*Portugal; \*engineering geology; \*seismology ;  
 soil mechanics; elastic waves ; earthquakes; San Jose;  
 Nevier; Mijagal; failure; probability; geologic hazards;  
 Europe; microseisms; intensity; relation; structures  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

779570 76-05816

**Segurancia e coeficiente de segurancia em geotecnica**  
**Safety and safety factor in engineering geology**  
 Nascimento, U.; Branco Falcao, Castel  
 Geotecnica (Agrupamento Port. Mec. Solos Rochas) 1, 31-46  
 p., 1971

Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Portuguese Summary Languages: English  
 illus. table  
 Descriptors: \*engineering geology ; rock mechanics ; rocks  
 ; brittle; deformation; cohesion; mathematical models;  
 probability; failure; safety  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

779447 76-05693

**D veroyatnosti vliyaniya tektonicheskogo faktora na probiznaniye poverkhnosti Apsheronskogo poluostrova**  
**Probability of the influence of tectonic factors on undulations of the surface of the Apsheron Peninsula**  
 Guseyn-Zade, O. D.; Yashchenko, V. R.  
 Geod. Kartogr. 6, 16-18p., 1974  
 CODEN: GZKGAS

Subfile: B  
 Country of Publ.: Union of Soviet Socialist Republics  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Russian  
 block diag.  
 Descriptors: \*USSR; \*engineering geology ; land subsidence  
 ; Apsheron Peninsula; Sutgait; Balakhany; Tyurkany;  
 Karadag; geotectonic measurement; relation; petroleum;  
 deposits; production  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

779328 76-05574

**Proposta di un metodo statistico per lo studio della stabilita dei versanti**  
**A statistical method for slope stability studies**

Magaldi, D.  
 Geol. Tec. 19: 4, 121-126p., 1972  
 CODEN: GETEAX  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Italian Summary Languages: French  
 illus., tables  
 Descriptors: \*engineering geology; \*environmental geology ;  
 slope stability; reclamation ; statistical methods;  
 prediction; examples; Europe; Italy; slopes  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

779313 76-05559

**Studio geomecanico della frana in roccia al km 193 della S.S. 42 Tonale e della Mendola (Trentino)**  
**A geomechanical study of a rockslide at kilometer 193 between Tonale and Mendola on S.S. 42, Trentino**

Largaioli, T.; Tersar, A.  
 Geol. Tec. 21: 5, 188-195p., 1974  
 CODEN: GETEAX  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: Italian Summary Languages: English  
 illus., sketch map  
 Descriptors: \*structural analysis; \*Italy; \*engineering geology ;  
 interpretation; rock mechanics ; rockslides;  
 friction; cohesion; hydrostatic pressure; Trentino; Tonale  
 ; Mendola; statistical analysis; slope stability;  
 mechanism; highways; Europe  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

777321 76-03567  
methods: fragmentation; shaped charges; jets; velocity;  
rock type; experimental studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Numerical dynamic analysis of quartz deformation lamellae**

and calcite and dolomite twin lamellae  
Shang, J. H.; Van der Lee, Joyceanne  
Geol. Soc. Am. Bull. 86: 9, 1266-1272p., 1975  
CODEN: BUGCMAF

Subfile: B  
Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.

Descriptors: deformation; experimental studies;  
lamellae; deformation lamellae; quartz; twin lamellae;  
calcite; dolomite; twin gliding; dynamics; analysis;  
methods; statistical methods; numerical dynamic analysis;  
structural analysis; petrofabrics; rock mechanics; samples;  
Rocky Mountains; Canada  
Section Headings: 16 (STRUCTURAL GEOLOGY)

774946 76-01192

**A statistical theory of the polyaxial strength of materials**

Lundborg, N.  
Int. Soc. Rock Mech., Congr., Proc., 3, Vol. 2, Part A:  
Advances in rock mechanics; reports of current research,  
180-185p., 1974  
CODEN: 32ZU44

Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
Note: Includes appendix of mathematical derivations,  
illus.

Descriptors: engineering geology; materials; properties;  
strength; distribution; models; polyaxial; stress;  
yield planes; internal friction; theoretical studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

774590 76-00836

**Statistical study of rock drilling by hypervelocity jets**

from explosive shaped charges  
Rollins, Ronald R.; Clark, George B.; Brown, John W.  
Univ. Mo., Rock. Mech. Explos. Res. Cent., USA, Enforc.  
Saf. Admin., United States  
Int. Soc. Rock Mech., Congr., Proc., 3, Vol. 2, Part B:  
Advances in rock mechanics; reports of current research,  
1384-1389p., 1974  
CODEN: 32ZU44

Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.; table  
Descriptors: engineering geology; rock mechanics;

774582 76-00828

**Statistical analysis of percentage of failed rock for the purpose of selecting the location of the Salakovac diversion tunnel**

Selimovic, Mustafa  
Int. Soc. Rock Mech., Congr., Proc., 3, Vol. 2, Part B:  
Advances in rock mechanics; reports of current research,  
1326-1331p., 1974  
CODEN: 32ZU44  
Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.; sketch map  
Descriptors: Yugoslavia; engineering geology; dams;  
Neretva River; Salakovac Tunnel; rock mechanics; rocks;  
fractured; site exploration; tunnels; diversion tunnels;  
Europe  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

774542 76-00788

**A probabilistic approach to geologic investigations for hard-rock tunnels**

Vick, Steven G.; Einstein, Herbert H.  
Dames and Moore, Salt Lake City, Utah, USA  
Int. Soc. Rock Mech., Congr., Proc., 3, Vol. 2, Part B:  
Advances in rock mechanics; reports of current research,  
1069-1075p., 1974  
CODEN: 32ZU44  
Subfile: B

Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.  
Descriptors: engineering geology; tunnels; theoretical studies; methods; prediction; conditions; rock mechanics;  
hard rocks; probability analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

774528 76-00774  
Probability of pillar failure at Elliot Lake  
Coates, D. F.  
Int. Soc. Rock Mech., Congr., Proc. 3, Vol. 2, Part B:  
Advances in rock mechanics: reports of current research,  
990-996p., 1974  
CODEN: 32ZUA4  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
Descriptors: Ontario; engineering geology; rock  
mechanics; Elliot Lake; mining geology; excavations;  
subsurface; pillars; strength; failure; field studies;  
Canada  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

765243 75-33132  
New seismic study begins in Puerto Rico  
Tarr, Arthur C.  
Earthquake Inf. Bull. 6: 4, 23-26p., 1974  
CODEN: NEIBAC  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., sketch map  
Descriptors: seismology; Puerto Rico; engineering geology  
; observatories; earthquakes; seismic zones; seismic  
risk; statistical methods; West Indies; regional  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

764395 75-30327  
Engineering-geological and geological-economical prerequisites  
of underground construction  
Shvetsov, P. F.; Zilberbord, A. F.  
All-Union Sci. Res. Inst. Hydrogeol. Eng. Geol., Moscow, VII  
Int. Assoc. Eng. Geol., Int. Congr., Proc. 2, Vol. 2, VII  
12, 1-VII 12, 6p., 1974  
CODEN: 29ZJAG  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
Descriptors: USSR; engineering geology; underground  
installations; factors; geological; economics;  
theoretical studies; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

764394 75-30326  
Tectonic stress fields and methodology of their

determination and consideration in engineering geological  
examinations and constructing underground structures  
Turchaninov, I. A.; Markov, G. A.; Pavin, V. I.  
USSR Acad. Sci., Kola Branch, Apatity, SUN  
Int. Assoc. Eng. Geol., Int. Congr., Proc. 2, Vol. 2, VII  
11, 1-VII 11, 6p., 1974  
CODEN: 29ZJAG  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.  
Descriptors: engineering geology; methods; statistical  
methods; calculations; stress fields; tectonics;  
underground installations; mathematical models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

764393 75-30325  
Engineering geological aspects on the lining of caverns in  
sedimentary rock  
Heitfeld, K. H.; Hesse, K. H.  
Lehrstuhl Ingenieurgeo. Hydrogeol., Rein, DFU  
Int. Assoc. Eng. Geol., Int. Congr., Proc. 2, Vol. 2, VII  
10, 1-VII 10, 12p., 1974  
CODEN: 29ZJAG  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus., tables  
Descriptors: engineering geology; theoretical studies;  
anchoring; stabilization; excavations; underground;  
effects; fabric; joints; mechanical properties; methods;  
statistical methods; caves; sedimentary rocks  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

764391 75-30323  
**Complex documentation of exploratory working**  
 Hensky, O.; Muller, K.; Travnicek, L.  
 GEOTEST, Natl. Enterprise Brno, Ostrava Branch, Ostrava, CSK  
 Int. Assoc. Eng. Geol., Int. Congr., Proc., 2, Vol. 2, VII  
 8 1-VII 8 7p., 1974  
 CODEN: 29ZJ49  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Descriptors: \*Czechoslovakia; \*engineering geology;  
 methods; statistical methods; documentation; data; Europe  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

764362 75-30294  
**Mesures du coefficient de permeabilite par essais ponctuels**  
**Measurement of permeability**  
 Rat, N.; Laviron, F.  
 Lab. Cent. Ponts et Chaussées, Orly Aerogare, FRA  
 Int. Assoc. Eng. Geol., Int. Congr., Proc., 2, Vol. 2, VI  
 16 1-VI 16 6p., 1974  
 CODEN: 29ZJ49  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: French Summary Languages: English  
 Descriptors: \*France; \*engineering geology; methods;  
 coefficient; statistical methods; measurement; permeability;  
 mathematical models; Europe  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

764259 75-30191  
**A factor of safety approach for evaluating seismic stability**  
**of slopes**  
 Roth, Wolfgang; Lee, Kenneth L.  
 Univ. Calif., Los Angeles, USA  
 U. S. National conference on earthquake engineering, Ann  
 Arbor, Mich., United States, June 18-20, 1975  
 U. S. Natl. Conf. Earthquake Eng., Proc., 1975, 156-165p.,  
 1975  
 Subfile: B  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Descriptors: \*engineering geology; methods; statistical  
 methods; finite element analysis; slope stability; seismic;  
 factors; safety  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

764349 75-30281  
**Geometrical characterization of jointing of rock masses**  
 Maranhao, N.  
 COEPF Eng. Dep. Geomec., Rio de Janeiro, BRA  
 Int. Assoc. Eng. Geol., Int. Congr., Proc., 2, Vol. 2, VI  
 3 1-VI 3 10p., 1974  
 CODEN: 29ZJ49  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Descriptors: \*engineering geology; methods; statistical  
 methods; joints; patterns; concepts; theoretical studies;  
 mathematical models; applications; dams; foundations;  
 Europe; Portugal; Alto Lindoso Dam; Spain; Alcantara Dam  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

764251 75-30183  
**Statistical uncertainty of design based on smoothed response**  
**spectra**  
 Donovan, N. C.; Valera, J. E.; Beresford, P. J.  
 James & Moore, San Francisco, USA  
 U. S. National conference on earthquake engineering, Ann  
 Arbor, Mich., United States, June 18-20, 1975  
 U. S. Natl. Conf. Earthquake Eng., Proc., 1975, 53-59p.,  
 1975  
 Subfile: B  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic  
 Level: ANALYTIC  
 Languages: English  
 Descriptors: \*engineering geology; \*seismology;  
 earthquakes; methods; ground motion; response spectra;  
 effects; design; evaluation; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

764391 75-30323  
**Complex documentation of exploratory working**  
 Hensky, O.; Muller, K.; Travnicek, L.  
 GEOTEST, Natl. Enterprise Brno, Ostrava Branch, Ostrava, CSK  
 Int. Assoc. Eng. Geol., Int. Congr., Proc., 2, Vol. 2, VII  
 8 1-VII 8 7p., 1974  
 CODEN: 29ZJ49  
 Subfile: B  
 Doc Type: SERIAL Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 Descriptors: \*Czechoslovakia; \*engineering geology;  
 methods; statistical methods; documentation; data; Europe  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

763714 75-29571

**Geology and probability in the assessment of seismic risk**

Esteve, L. Autonoma Mexico, Mexico, MEX  
Univ. Assoc. Eng. Geol., Int. Congr., Proc. 2, Vol. 1, II  
PC 2.1-11 PC 2.14p., 1974

CODEN: 29ZJAG  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
Descriptors: sketch map, tables  
theoretical studies; earthquakes; seismic risk;  
probability; evaluation; Mexico  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

763653 75-29510

**Distribution analysis of soil-physical characteristics for engineering geological purposes**

Paal, T. Munk. Plan. Off. Civl. Eng., Soil Mech. Sec., Budapest,  
Int. Assoc. Eng. Geol., Int. Congr., Proc. 2, Vol. 1, IV  
3.1-1V 3.6p., 1974

CODEN: 29ZJAG  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
Descriptors: Hungary; engineering geology; soils;  
methods; engineering properties; soil mechanics; Budapest;  
statistical methods; evaluation; Buda Marl; Kiscell Clay;  
Kolmogorov-Smirnov method; Europe; marl; clays  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

763637 75-29494

**Proprietes des calcaires  
The properties of carbonate rocks**

Lourenco, C. Archimbaud, C.  
Int. Assoc. Eng. Geol., Int. Congr., Proc. 2, Vol. 1, IV  
19.1-IV 19.7ip., 1974

CODEN: 29ZJAG  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: French Summary Languages: English  
Descriptors: engineering geology; sedimentary rocks;  
methods; carbonate rocks; statistical methods; evaluation;  
physical properties; Europe; France; properties; strength  
compression; elastic properties; utilization  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

763066 75-28840

**Ob informatsionno-statisticheskikh priyemakh interpretatsii  
kompleksnykh geologo-geofizicheskikh izyskaniy  
The statistical data for the interpretation of complex  
geological and geophysical investigations**

Khmelevskoy, V. K.  
Moscow, Univ., Vestn., Ser. Geol., 4, 74-80p., 1974

CODEN: VMUGAR  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Russian  
Descriptors: geophysical methods; engineering geology;  
methods; frost action; statistical methods; interpretation;  
theoretical studies; models; mathematical methods;  
applications; permafrost  
Section Headings: 20 (GEOPHYSICS, APPLIED)

762313 75-28084

**Sedimentation rates in small headwater reservoirs in Montana**

Marsh, Phyllis S.  
Montana  
208p., 1974

Subfile: B  
Degree Level: Doctoral  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Diss. Abstr. Int., Vol. 35, No. 7, p. 34308, 1975.  
Descriptors: Montana; engineering geology; reservoirs;  
surface; sedimentation; rates; drainage basins; alpine;  
statistical methods; United States  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

760375 75-26146

**Analysis of seismic risk**

Caputo, M.  
Univ. Bologna, Inst. Geofis., Bologna, ITA  
NATO Adv. Study Inst. Ser., Ser. E, Appl. Sci. 3, 55-85  
1974

CODEN: NASEDC

Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus: tables, sketch maps  
Descriptors: Italy; earthquakes; engineering geology;  
seismology; Europe; seismic risk; distribution; frequency  
; seismicity; zoning; applications; statistical methods  
; Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

760240 75-26011

**Lineamenti granulometrici e calcimetrici della spiaggia  
emersa e sommersa lungo il litorale romagnolo-marchigiano  
tra le foci dei fiumi Savio e Foglia**  
The granulometric and calcimetric lineaments of the emerged  
and submarine beach along the Romagna and Marche's shelf  
between the Savio and Foglia estuaries, Italy

Antoniazzi, Alberto  
Publ. Camera Commer. Ind. Artigianato Agr.  
33p., 1975

Subfile: B

Country of Publ.: Italy

Doc Type: BOOK Bibliographic Level: MONOGRAPHIC

Languages: Italian

Tables: 1; 200,000; granulometric  
Descriptors: Italy; engineering geology; sedimentation;  
sediments; shorelines; environment; environmental  
analysis; beaches; conservation; Romagna; Marche; Savio  
River; Foglia River; Adriatic Sea; marine; littoral;  
subaqueous; subaerial; granulometry; calcimetry;  
statistical methods; provenance; clastics; terrigenous;  
carbonates; stabilization; Europe  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

757336 75-23107

**Preparation and use of isopleth maps of landslide deposits  
(discussion and reply)**

Vitek, John D.; Wright, R. H.; Campbell, R. H.; Nielsen, T.  
H.

Geology (Boulder) Vol. 3, No. 4, p. 217-218, 1975

CODEN: GIGYBA

Subfile: B

Doc Type: SERIAL

Languages: English

For reference to article by Wright, R. H., et al., see

Geology (Boulder), Vol. 2, p. 483, 1974  
Descriptors: geomorphology; engineering geology; mass  
movements; slope stability; landslides; statistical  
methods; maps; isopleth; utilization  
Section Headings: 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

756458 75-22229

**Low-rise building damage from low-amplitude ground motions**  
Scholl, Roger E.  
Seismol. Soc. Am., Bull. Vol. 64, No. 6, p. 1743-1755,  
illus. (incl. sketch map), 1975

CODEN: BSSAAP

Subfile: B

Doc Type: SERIAL

Languages: English

Descriptors: Nevada; seismology; engineering geology;  
Nuclear explosions; damage; south; Nevada Test Site; Las  
Vegas; Tonopah; Beatty; Underground; effects; buildings;  
Ground motion; low amplitude; low-rise buildings;  
correlation; statistical methods; United States  
Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

756114 75-21885

**Adjustment of logarithmic flood-frequency statistics for  
gaged California streams to minimize the time sampling error**

Rantz, S. E.; Crippen, J. R.

J. Res. U.S. Geol. Surv. Vol. 3, No. 1, p. 113-121, sketch  
map, 1975

CODEN: JRGSAW

Subfile: B

Doc Type: SERIAL

Languages: English

Descriptors: California; hydrology; environmental geology  
; engineering geology; hydrogeology; rivers and streams;  
Geologic hazards; regional; United States; floods;  
frequency; analysis; sampling; errors; time; statistical  
methods; logarithms; techniques  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

755053 75-20824

Gully Erosion, Northwestern Colorado: A Threshold Phenomenon  
Patton, Peter C.; Schumm, Stanley A.  
Goulder (Boulder) Vol. 3, No. 2, p. 88-89, illus., 1975  
CODEN: GLGYBA  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Colorado; \*Geomorphology; \*Engineering geology  
; Processes: Slope stability; Erosion; gullies;  
drainage basins; Piceance Creek; Yellow Creek;  
sedimentation; slopes; critical; threshold; analysis;  
statistical methods; oil shale; United States  
Section Headings: 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

755006 75-20777

International Field Year for the Great Lakes  
Phillips, D. J.  
IFGI Bull. No. 11, 113 p., illus., 1974  
CODEN: IFYGAP  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Geomorphology; \*Great Lakes; \*Associations;  
Landscape features: Areal geology; General; Surveys;  
statistical studies; field studies; hydrology; pollution;  
chemistry; biology; climatology; current research; United  
States; Canada; hydrogeology; engineering geology;  
environmental geology; International Field Year for the Great  
Lakes  
Section Headings: 13 (AREAL GEOLOGY, GENERAL)

754840 75-20611

The approximate probability density function of range and  
adjusted range  
Sutabutr, Prathet.  
In Water for the Human Environment (edited by Chow, V. T.,  
et al.); Vol. 4, Special sessions; Systems analysis, p.  
427-438, illus.,  
Int. Water Resour. Assoc. Champaign, Illinois, 1973  
Subfile: B  
Languages: English  
Descriptors: \*Engineering geology; Reservoirs; Surface;  
storage; volume; water level; distribution; estimation;  
mathematical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

753385 75 19156

Range of cumulative sums; I. Exact and approximate expected  
values

Salas-La Cruz, J. D.  
J. Hydrol., Vol. 23, No. 1-2, p. 39-66, illus., 1974  
CODEN: JHYDA7  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Reservoir storage  
Descriptors: \*Engineering geology; Reservoirs; Surface;  
storage; variations; Fluctuations; theoretical studies;  
mathematical methods; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

753381 75-19152

Range of cumulative sums; II. Application to storage  
capacity of reservoirs

Salas-La Cruz, J. D.  
J. Hydrol., Vol. 23, No. 3-4, p. 329-339, illus., 1974  
CODEN: JHYDA7  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; Reservoirs; Surface;  
storage; capacity; determination; theoretical studies;  
mathematical methods; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

752546 75-18317

The serial correlation in a simple dam process  
Blomqvist, Nils.

In Modeling of Water Resources Systems I (edited by Sivas,  
Asit K.), p. 283-298.

Harvest House Montreal, 1972  
Subfile: B  
Languages: English  
Descriptors: \*Engineering geology; Dams; Mathematical  
methods; statistical methods; storage; hydrology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)



751006 75-16777  
**Friction Characteristic of Graphite Coated Bedding Joints in Shale**  
 Chappel, B. A.  
 Int. J. Rock Mech. Min. Sci. Vol. 12, No. 2, p. 33-39, illus., 1975  
 CODEN: IJRM2A  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Rock mechanics; \*Sedimentary rocks; \*models; \*statistical; \*analysis; \*friction; \*properties; \*joints; \*natural; \*graphite-coated; \*shale; \*response; \*deformation; \*stiffness; \*friction; \*angles; \*interaction; \*factors; \*experimental studies; \*theoretical studies  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

750487 75-16258  
**Statistical analysis of seismic environment in New York State**  
 De Chpua, N. J.; Liu, S. C.  
 In The Fifth Symposium on Earthquake Engineering (see Anand S. Aryal, p. 389-398, illus. (incl. sketch maps), 1974 Sarita Prakashan Nauchandi, Meerut, India, 1974  
 Subfile: B  
 Languages: English  
 Descriptors: \*Engineering geology; \*New York; \*Environmental geology; \*Seismology; \*Geologic hazards; \*Earthquakes; \*analysis; \*statistical methods; \*environment; \*seismicity; \*interpretation; \*applications; \*data; \*United States; \*regional  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

750097 75-15868  
**An analytical method for forecasting snow avalanches**  
 Chitadre, V. S.  
 In Physics of snow and snow avalanches, p. 262-270, Indian Natl. Sci. Doc. Cent. New Delhi, 1972  
 Subfile: B  
 Languages: English  
 Translated from Russian.  
 Descriptors: \*geomorphology; \*Engineering geology; \*Methods; \*Geologic hazards; \*Statistical methods; \*analysis; \*Prediction; \*mass movements; \*avalanches; \*snow; \*mathematical models; \*theoretical studies  
 Section Headings: 24 (SURFICIAL GEOLOGY, QUATERNARY GEOLOGY)

749942 75-15713  
**Geofizicheskiye issledovaniya kollektorskiikh svoyst v period v sverkhglubokikh skvazhinakh**  
 Geophysical investigations of rock-reservoir properties in very deep wells  
 Popov, V. K.  
 In Razvedochnaya geofizika SSSR na rubezhe 70-kh godov; Geofizicheskiye issledovaniya neftyanykh i gazovykh skvazhin, p. 283-287, illus., Izd. Nedra Moscow, 1974  
 Subfile: B  
 Languages: Russian  
 Descriptors: \*Petroleum; \*Engineering geology; \*Geophysical methods; \*Reserves; \*Rock mechanics; \*Methods; \*Reservoirs; \*Subsurface; \*porosity; \*permeability; \*statistical methods; \*Interpretation; \*applications; \*Pressure; \*resistivity; \*temperature; \*sedimentary rocks; \*depth; \*effects; \*exploration; \*properties; \*parameters  
 Section Headings: 20 (GEOPHYSICS, APPLIED)

750491 75-16252  
**Probability of failure of structures under earthquake excitations**  
 Tyengar, R. Narayana; Jagadish, K. S.  
 In The Fifth Symposium on Earthquake Engineering (see Anand S. Aryal, p. 253-258, illus., Sarita Prakashan Nauchandi, Meerut, India, 1974  
 Subfile: B  
 Languages: English  
 Descriptors: \*Engineering geology; \*Theoretical studies; \*Analysis; \*probability; \*failure; \*structures; \*effects; \*earthquakes; \*excitations  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

74RG20 75-14399

**Earthquake Damage and Related Statistics**

Steinbrugge, Karl V.; Schader, Eugene E.

In San Fernando, California, Earthquake of February 9, 1971; Volume 1, Effects on Building Structures; Part B, Buildings Continued; Soils and Foundations (Edited by Neil A. Benfer and Jerry L. Coffman), p. 691-724, illus. (Incl. maps).

U. S. Dep. Commer., Natl. Oceanic Atmos. Adm., Environ. Res. Lab., Washington, D. C., 1973

Subfile B

Languages: English

Descriptors: \*California; \*Engineering geology; Earthquakes; Los Angeles County; San Fernando; Effects; damage; economics; 1971; United States

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

747041 75-12864

**The measurement of spatial deformations by geodetic methods**

Askerazzi, V.

In Field Instrumentation in Geotechnical Engineering, p. 1-12, illus.

John Wiley & Sons, New York, 1974

Subfile B

Languages: English

Descriptors: \*Engineering geology; Methods; Geophysics; deformation; spatial; measurement; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

741941 75-10783

**Statistical Correlation of Physical Properties and Sound Velocity in Sediments**

Anderson, Richard S.

In Physics of Sound in Marine Sediments, Mar. Sci. Vol. 1, p. 481-518, illus. (Incl. sketch maps), 1974

Subfile B

Doc Type SERIAL

Languages: English

Descriptors: \*Ocean floors; \*Geophysical methods; \*Engineering geology; Sedimentation; properties; Acoustical methods; Materials; Sediments; Interpretation; marine; velocity; correlation; grains; size; statistical methods; elastic waves

Section Headings: 20 (GEOPHYSICS, APPLIED)

744797 75-10233

**Statistical Study of Geopressed Reservoirs in Southwest Louisiana**

Perry, D. R., Jr.

In Third Symposium on Abnormal Subsurface Pore Pressure, Preprints, p. 115-117, illus. (Incl. sketch map).

Am. Inst. Min., Metall., and Pet. Eng., Inc., New York, 1972

Subfile B

Languages: English

Descriptors: \*Louisiana; \*Engineering geology; Reservoirs; subsurface; Southwest; Gulf Coastal Plain; gas; natural; pressure; geopressure; distribution; statistical methods; Tertiary; United States

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

744643 75-10079

**Finite element analysis of centrifuged and built-up slopes**

Smith, I. M.; Hobbs, R.

Geotechnique Vol. 24, No. 1, p. 531-559 (Incl. Fr. sum.), illus., 1974

CODEN GTNOA8

Subfile B

Doc Type SERIAL

Languages: English

Descriptors: \*Engineering geology; \*Soils; Slope stability; Engineering properties; Statistical methods; finite element analysis; experimental studies; field studies; dams; embankments; Soil mechanics

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

743746 75-09182

**Geologia aplicada al tratamiento de los macizos rocosos y técnicas de interpretación**  
Geology applied to the treatment of rocky massifs; techniques of interpretation  
Joullain, Charles.

**In II Coloquio Nacional de Mecanica de Rocas; Tema 3, Influencia de la presion intersticial sobre las condiciones resistentes.**

Spain, Serv. Geol. Obras Publicas, Bol. No. 33, p. 127-146, illus. (incl. map), 1970  
CODEN: SSGBBK

Subfile: B

Doc Type: SERIAL

Languages: Spanish

Descriptors: \*Engineering geology; \*tectonics; \*Fractures; Rock mechanics; Structure; Style; Foundations; Lithology; Mining; mapping; methods; Faults; Folds; Joints; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

743714 75-09150

**Tema 3; influencia de la presion intersticial sobre las condiciones resistentes**  
Influence of the interstitial pressure under the conditions of resistance  
Hacar Benitez, Miguel A.

**In II Coloquio Nacional de Mecanica de Rocas.**  
Spain, Serv. Geol. Obras Publicas, Bol. No. 31, p. 153, 1970

CODEN: SSGBBK

Subfile: B

Doc Type: SERIAL

Languages: Spanish

Descriptors: \*Engineering geology; \*Fractures; Rock mechanics; Style; joints; statistical methods; distribution; orientation; type; direction; dip

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

747684 75-09120

**Tema 1; permeabilidad de macizos rocosos; Metodos para medirla**  
Permeability of rocky massifs; Methods for measurement  
Alvarez Martinez, Alfonso.

**In II Coloquio Nacional de Mecanica de Rocas.**  
Spain, Serv. Geol. Obras Publicas, Bol. No. 31, p. 49-51, 1970

CODEN: SSGBBK

Subfile: B

Doc Type: SERIAL

Languages: Spanish

Descriptors: \*Engineering geology; Rock mechanics; Permeability; tests; Lugeon; cavities; shape; water circulation; vertical; horizontal; water table; tectonics; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

743566 75-09002

**Probabilistic Analysis of Seepage**

Wu, Tien H.; Vyas, Shyam K.; Chang, Nien-Yin. Am. Soc. Civil Eng., Proc. (J. Geotech. Eng. Div.) Vol. 100, No. GT3, p. 1252-1253, illus., 1974

CODEN: AUGEB6

Subfile: B

Doc Type: SERIAL

Languages: English

Descriptors: \*Engineering geology; Seepage; Analysis; probability

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

743550 75-08986

**Probabilistic Analysis of Seepage [discussion]**

Kelly, William E. Am. Soc. Civil Eng., Proc. (J. Geotech. Eng. Div.) Vol. 100, No. GT3, p. 373-374, 1974

CODEN: AUGEB6

Subfile: B

Doc Type: SERIAL

Languages: English

Descriptors: \*Engineering geology; Seepage; Analysis; probability

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)



742244 75-07661

Predicting coarse sediment transport; the Hjulstrom curve revisited  
Novak, Irwin D.

In Fluvial Geomorphology, p. 13-25, illus.,  
State Univ. N.Y., Binghamton, New York, 1973

Subfile B  
Languages: English  
Descriptors: \*Sedimentation; \*Sediments; \*Engineering geology; \*Geomorphology; \*Transport; \*Experimental studies; Environmental analysis; Fluvial features; Stream transport; erosion; deposition; coarse; velocity; prediction; floods; Hjulstrom curve; revision; theoretical studies; Statistical methods; streams; size; sorting; flume tank; mathematical studies  
Section Headings: 06 (PETROLOGY, SEDIMENTARY)

742126 75-07524

Propagation of Spartina alterniflora for substrate stabilization and salt marsh development  
Woodhouse, W. W., Jr.; Seneca, E. D.; Broome, S. W.  
U. S. Army, Coastal Eng. Res. Cent., Tech. Memr., No. 46,  
155 p., illus. (incl. sketch map), 1974

CODEN: ARTMAJ  
Subfile B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; \*North Carolina; \*Environmental geology; \*Plantae; \*Shorelines; \*reclamation; \*United States; \*salt marshes; \*soils; \*transplanting; \*seeding; \*distribution; \*effects; \*statistical studies; \*Spartina alterniflora; \*coastal; \*Cedar Island; \*Snow's Cut  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

741850 75-07248

Statisticheskaya obrabotka danykh laboratornykh ispytaniy porod; Obobshchennyye i raschetnyye pokazateli  
Statistical interpretation of laboratory test data of rocks; generalization and calculation parameters  
Bondarik, G. K.

In Spravochnik po inzhenernoy geologii; Gruntovedeniye, p. 66-73, illus.  
Izd. Nedra, Moscow, 1974  
Subfile B  
Languages: Russian  
Descriptors: \*Engineering geology; \*Methods; \*Statistical methods; \*applications; \*tests; \*interpretation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

741284 75-06682

Nekotoryye metodologicheskiye voprosy primeneniya statisticheskikh metodov v inzhenerno-geologicheskikh issledovaniyakh  
Some problems of methodology in applying statistical methods in engineering-geological investigations] [abstr.

Gorkhovskiy, V. M.  
Musk. Obo. Ispyt. Priir., Byull., Otd. Geol., Vol. 49, No. 1, p. 157-158, 1974

CODEN: BMPGAK  
Subfile B  
Doc Type: SERIAL  
Languages: Russian  
Descriptors: \*Engineering geology; \*Methods; \*Statistical methods; \*applications  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

741207 75-06605

Ob osnovnoy zakonomernosti intensivnosti gazovykh vzyryvov  
A principal regularity in the intensity of gas explosions

Kovach, F.  
Acta Geod. Geophys. Montan., Vol. 8, No. 3-4, p. 361-379 (incl. Eng), sum., illus., 1973

CODEN: AGGMB9  
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Doc Type: SERIAL  
Languages: Russian  
Descriptors: \*Mining geology; \*Engineering geology; \*Evaluation; \*Geologic hazards; \*Safety; \*gas explosions; \*Intensity; \*distribution; \*logarithmic; \*statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

741060 75-06458

Rock Property Correlation, Crescent Mine, Idaho [abstr.]  
Skinner, E. H.; Maddell, G. G.; McMillans, P. C.;  
Scheibner, B. J.

In New Horizons in Rock Mechanics; Evening Session.  
Symp. Rock Mech., Proc. No. 14, p. 754, 1973  
CODEN: PSRMAG  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: Idaho; Engineering geology; Rock mechanics  
; Crescent Mine; Stress; cores; statistical analysis;  
physical properties; regression analysis; quartzite; United  
States; Coeur d'Alene; Revett Quartzite  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

741036 75-06434

Rock structure design by failure probabilities  
Lundquist, Robert G.; Heins, Robert W.

In New Horizons in Rock Mechanics; Underground Design and  
Instrumentation.  
Symp. Rock Mech., Proc. No. 14, p. 329-337, illus., 1973  
CODEN: PSRMAG  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: Engineering geology; Rock mechanics  
Failure; pillars; safety; statistical methods; stress;  
strength  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

740499 75-05897

Strukturnyye modeli v inzhenernoy geologii  
Structural models in engineering geology

Rats, M. V.  
Izd. Nedra 214 p., illus., Moscow, 1973  
Subfile: B  
Languages: Russian  
Utilization of mathematical (structural) models for  
consideration of micro-heterogeneous and macro-heterogeneous  
rocks, experimental and theoretical investigations in applied  
engineering geology  
Descriptors: Engineering geology; Mathematical models;  
Textbooks; methods; Models; structural models;  
applications; mathematical methods; statistical methods;  
mathematical models; practice  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

740022 75-05420

Seismicity of Hong Kong

Lau, R.  
Hong Kong, R. Obs., Tech. Note No. 33, 18 p., illus. (incl.  
sketch maps), 1972  
CODEN: HKONAK  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: Hong Kong; Earthquakes; Engineering geology  
; Seismology; Asia; Seismicity; Swatow, 1918;  
possibilities; probability; production; Seismic risk  
Section Headings: 19 (GEOPHYSICS, SEISMOLOGY)

739564 75-05362

Variations in the significance of soil and testing of  
parameters on permeability at different stages of  
consolidation  
Tumay, Mehmet T.

In Proceedings of the Third Southeast Asian Conference on  
Soil Engineering; Technical Session 4, Soil Testing, p.  
247-261, illus.  
Southeast Asian Soc. Soil Eng. Hong Kong, 1972  
Subfile: B  
Languages: English  
Descriptors: Engineering geology; Experimental studies;  
Soils; consolidation; effects; permeability; factors;  
clay minerals; abundance; granulometry; techniques; sample  
preparation; interpretation; statistical methods;  
correlation; regression analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

739022 75-04417

Environments of deposition on an offshore barrier sand bar, Moriches Inlet, Long Island, New York [with comments] Mackenzie, Michael G.

In Barrier islands, p. 222-235, illus. (incl. sketch maps). Dowden, Hutchinson & Ross Stroudsburg, Pennsylvania, 1973  
Subfile B  
Languages: English  
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Descriptors: \*New York; \*Sedimentation; \*Sediments; \*Geomorphology; \*Engineering geology; \*Sedimentary petrology; \*Shorelines; \*Clastics; \*Terrigenous; \*Shore features; \*Marine transport; \*Wind transport; \*Long Island; \*Moriches Inlet; \*erosion; \*littoral; \*erosion; \*concepts; \*budget; \*size; \*distribution; \*environmental analysis; \*heavy \*Atlantic Coastal Plain; \*Sand; \*granulometry; \*statistical \*minerals; \*indicators; \*samples; \*beaches; \*dunes; \*swamps; \*methods; \*Barrier bars; \*beaches; \*berms; \*dunes; \*swamps; \*marshes; \*inlets; \*streams; \*bays; \*environment; \*maps; \*United States  
Section Headings: 06 (PETROLOGY, SEDIMENTARY)

739334 75-03729

Statistical studies of earthquakes associated with Lake Benmore, New Zealand Adams, R. D.

In Seismic effects of reservoir impounding. Eng Geol. Vol. 8, No. 1-2, p. 155-169, illus. (incl. sketch maps), 1974  
CODEN: EGGDAD  
Subfile B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*New Zealand; \*Engineering geology; \*Earthquakes; \*Seismology; \*reservoirs; \*Observations; \*Australia; \*dams; \*South Island; \*Lake Benmore; \*Surface; \*water storage; \*impounding; \*effects; \*analysis; \*statistical \*methods; \*data; \*pre-impounding; \*post-impounding; \*Benmore Dam; \*microearthquakes; \*seismic sources; \*seismicity; \*distribution; \*magnitude; \*causes  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

736187 75-01569

Prognoz stiykosti zsuynnikh skhilliv na dilyntsi tret'oi chergi budivnitstva protizsuynnikh sporud u m. Odessa Prediction of the stability of post-landslide slopes along the 3rd bend of the construction preventing landslides, Odessa Zelins'kiy, I. P.; Cherkez, F. A.

In Geologiya uzberezhzhya i dna Chernogo ta Azovs'kogo moriv u mezkhakh UKSR, Mizh. Resp. Nauk. Zbi. No. 7, p. 77-82 (with Engl., Russ. sum.), illus. (incl. sketch maps), 1974  
Subfile: B

Languages: Ukrainian  
Descriptors: \*USSR; \*Engineering geology; \*Slope stability; \*Landslides; \*Ukraine; \*Odessa; \*prevention; \*constructions; \*design; \*Statistical studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

734823 75-00204

A statistical network model and theory of porous media Schopper, Jurgen R.

In Pore Structure and Properties of Materials--Structure des Pores et Proprietes des Materiaux, Part 1; Models and Geometry of Pore Structure, p. A53-A72 (incl. Fr. sum.), Academia Prague, 1973  
Subfile: B  
Languages: English  
Descriptors: \*Sedimentary rocks; \*Sediments; \*Engineering geology; \*Properties; \*Materials; \*porosity; \*physical properties; \*mathematical models; \*measurements; \*theoretical studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

734094 74-39241

Engineering Geologic, Geophysical, Hydrologic and Rock-Mechanics Investigations of the Straight Creek Tunnel Site and Pilot Bore, Colorado Robinson, Charles S.; Lee, Fitzhugh T.

U. S. Geol. Surv., Prof. Pap. No. 815, 134 p., illus. (incl. colored geol. map 1:12,000), 1974  
CODEN: XGPP49  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Colorado; \*Engineering geology; \*Maps; \*Tunnels; \*United States; \*Clear Creek County; \*Straight Creek Tunnel; \*southwest; \*geologic; \*sections; \*Site exploration; \*boreholes; \*pilot bore; \*rock mechanics; \*geophysical surveys; \*well-logging; \*hydrogeology; \*statistical analysis; \*data; \*areal geology  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

731237 74-36384

ANISOTROPY OF PHYSICAL PROPERTIES IN METAMORPHIC ROCKS  
Johnson, L. R.; Wenk, H.-R.  
Tectonophysics Vol. 23, No. 1-2, p. 79-98, illus., 1974  
CODEN: TCTOAM  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Metamorphic rocks; \*Engineering geology;  
\*Seismology; Properties; elastic waves; Rock mechanics;  
Physical properties; elastic properties; thermal properties;  
anisotropy; correlation; experimental studies; velocity;  
data; applications; exploration; geophysical methods;  
mantle; samples; Europe; Alps; Alpine; fabric; analysis;  
Statistical methods  
Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

729505 74-34649

FABRIC CHANGES IN CONSOLIDATED KAOLIN  
McConnachie, I.  
Gotechnique Vol. 24, No. 2, p. 207-222 (incl. Fr. sum).  
illus., 1974  
CODEN: GIMQAB  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: Electron microscopy, quantitative analysis  
Kaolin; experimental studies; consolidation; mechanism;  
observations; changes; fabric; microstructure; domains;  
dimensions; electron microscopy; statistical methods;  
quantitative analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

727330 74-32471

STATISTICAL TESTS FOR PREFERRED ORIENTATION [abstr.]  
Dudley, Richard M.; Gine, Evarist; Perkins, Priscilla C.  
Eos (Am. Geophys. Union, Trans.) Vol. 55, No. 4, p. 419,  
1974  
CODEN: EOSTAJ  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; Rock mechanics;  
Preferred orientation; tests; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

727050 74-32191

PRELUCRAREA SI SINTEZA DATELOR HIDROGEOLOGICE  
Gheorghe, Alexandru.  
Ed. Teh. 419 p. (incl. Engl. sum.), illus. (incl. geol. map  
1:400,000), Bucharest, 1973  
Subfile: B  
Languages: Romanian  
Descriptors: \*Hydrogeology; \*Ground water; \*Engineering  
geology; Methods; textbooks; Systems analogs;  
Statistical methods; lithofacies; permeability; Europe;  
Romania; hydrodynamics; models; faults; porosity; water  
resources; reservoirs; subsurface; recharge; aquifers;  
Romanian  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

725017 74-30158

NUMERICAL SEISMIC ZONING AND SEISMIC STABILITY [abstr.]  
Caputo, Michele; Postpischl, Daniele.  
Eos (Am. Geophys. Union, Trans.) Vol. 55, No. 7, p. 684,  
1974  
CODEN: EOSTAJ  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Seismology; \*Earthquakes; \*Engineering geology  
Geologic hazards; seismic risk; zoning; seismicity;  
mechanism; Seismic sources; magnitude; seismicity;  
determination; statistical methods; numerical; effects  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

725017 74-30158

PRELUCRAREA SI SINTEZA DATELOR HIDROGEOLOGICE  
Gheorghe, Alexandru.  
Ed. Teh. 419 p. (incl. Engl. sum.), illus. (incl. geol. map  
1:400,000), Bucharest, 1973  
Subfile: B  
Languages: Romanian  
Descriptors: \*Hydrogeology; \*Ground water; \*Engineering  
geology; Methods; textbooks; Systems analogs;  
Statistical methods; lithofacies; permeability; Europe;  
Romania; hydrodynamics; models; faults; porosity; water  
resources; reservoirs; subsurface; recharge; aquifers;  
Romanian  
Section Headings: 21 (HYDROGEOLOGY AND HYDROLOGY)

725017 74-30158

NUMERICAL SEISMIC ZONING AND SEISMIC STABILITY [abstr.]  
Caputo, Michele; Postpischl, Daniele.  
Eos (Am. Geophys. Union, Trans.) Vol. 55, No. 7, p. 684,  
1974  
CODEN: EOSTAJ  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Seismology; \*Earthquakes; \*Engineering geology  
Geologic hazards; seismic risk; zoning; seismicity;  
mechanism; Seismic sources; magnitude; seismicity;  
determination; statistical methods; numerical; effects  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

725001 74-30142

Zastosowanie analizy czynnikowej; sposob R do populacji geologicznej glin zwalowych z obszaru Szczecina i okolic  
 Application of factor analysis, R-mode, to the study of geological populations of tills from Szczecin and its vicinity  
 Lipinska, Nina. Vol. 22, No. 4, p. 153-156 (incl. Engl., Przegi. Geol., Russ. sum.). 1974  
 CODEN: PRZGAL  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: Polish  
 Descriptors: \*Engineering geology; \*Poland; \*Sediments; \*Materials; \*properties; \*Clastics; terrigenous; \*Till; weight; specific weight; moisture; plasticity; granulometry; factor analysis; R-mode; Szczecin; grains; size; physical properties; statistical methods; Pleistocene; Europe; northwest  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

724650 74-29791

Engineering geologic map units for highway planning; a qualitative approach  
 Edwards, Larry J. Ann. Highway Geol. Symp., Proc. No. 24, p. 37-59, illus. (incl. Geol. sketch map). 1973  
 CODEN: PAHGAG  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*soils; \*Wyoming; Highways; Properties; Site exploration; planning; mapping; evaluation; sedimentary rocks; engineering properties; surveys; statistical methods; texture; grains; size; applications; mineral composition; variations; limits; profiles; Kaycee; Barnum; Johnson County; quantitative; objections; construction; United States  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

722276 74-27417

On the chance of culvert washouts on a long railway line  
 Ribben, F. M. J. In Hydrology Papers 1971, p. 55-59, illus. Inst. Eng. Sydney. 1971  
 Subfile: B  
 Languages: English  
 Descriptors: \*Australia; \*Engineering geology; \*Geologic hazards; \*Floods; washouts; prediction; arid regions; statistical methods

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

718815 74-23952

On the variance of the stationary probability vector for a finite dam  
 Jarvis, C. L. J. Hydrol. Vol. 21, No. 3, p. 291-297, 1974  
 CODEN: JHYDA7  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Dams; \*Theoretical studies; statistical methods; hydrology; models  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

718098 74-23235

Firm reservoir yield; how reliable are historic hydrological records  
 Wallis, James R.; O'Connell, P. Enda.

In International Symposium on the Hydrology of Lakes. Int. Assoc. Hydrol. Sci.--Assoc. Int. Sci. Hydrol., Bull. Vol. 18, No. 3, p. 347-365 (incl. Fr. sum.), illus., 1973  
 CODEN: HYSBAY  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Statistical analysis  
 Descriptors: \*Engineering geology; \*Reservoirs; \*Design; yield; prediction; statistical methods; automatic data processing  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Section Headings: 26 (ECONOMIC GEOLOGY, GENERAL & MINING)

717926 74-23062

A statistical model for determining the sediment yields from urban and rural landscapes along Breakneck Creek, Portage and Stark Counties, Ohio [abstr.]  
Smith, Harris T.

In North-Central Section, 8th Annual Meeting.  
Geol. Soc. Am., Abstr., Vol. 6, No. 6, p. 546-547, 1974  
CODEN: GAAPBC  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: Ohio; Engineering geology; Waterways; Stark County; Portage County; Breakneck Creek; Streams; Sediments; Load; measurement; statistical methods; United States  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

717638 74-22774

K voprosu o statisticheskoj obrabotke dannyh fizicheskikh svoystv gornyh porod  
Statistical survey data on the physical properties of rocks  
Mihasyan, P S  
Akad. Nauk Arm. SSR, Izv., Nauki Zemle Vol. 24, No. 1, p. 85-87, illus., 1971

CODEN: IAAZAT  
Subfile: R  
Doc Type: SERIAL  
Languages: Russian  
Descriptors: Engineering geology; Geophysical methods; Rock mechanics; Electrical methods; Igneous rocks; Volcanic; statistical methods; experimental studies; Mineralogical studies; interpretation; electrical surveys; Maps; physical properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

717123 74-22259

Bentonite characteristics from deposits near Rosalind, Alberta

Scafe, D. W.  
Clays Clay Miner., Vol. 21, No. 6, p. 437-449 (incl. Fr., Ger., Russ. sum.), illus. (incl. sketch map), 1973  
CODEN: CIGMAR  
Subfile: R  
Doc Type: SERIAL  
Languages: English  
Descriptors: Alberta; Bentonite; Engineering geology; Economic geology; Canada; Materials; properties; Rosalind; Battle River; Cretaceous; physical properties; variations; composition; mineralogy; geochemistry; analysis; statistical methods

716571 74-21705

Application of Factor Analysis to Classification of Engineering-Geological Environments  
Miatr., Imer; Stenzel, Przemyslaw.  
Int. Assoc. Math. Geol., J., Vol. 6, No. 1, p. 17-31, illus. (incl. sketch maps), 1974  
CODEN: IMGURS  
Subfile: B

Doc Type: SERIAL  
Languages: English  
Soils, cluster analysis, automatic data processing  
Descriptors: Engineering geology; soils; Methods; Engineering properties; Statistical methods; cluster analysis; factor analysis; site exploration; classification; automatic data processing; Soil mechanics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

715489 74-20623

Statistical description of observed low-rise building damage for low amplitude ground motions [abstr.]

Scholl, Roger E.; Blume, John A.

In Cordillera Section, 70th Annual Meeting.  
Geol. Soc. Am., Abstr., Vol. 6, No. 3, p. 310, 1974  
CODEN: GAAPBC  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: United States; Engineering geology; Nuclear explosions; southwest; California; Nevada; Nevada Test Site; Ground motion; buildings; damage  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

715438 74-20572

Hazard exposure [abstr.]  
Chou, I. H.

In Cordilleran Section, 70th Annual Meeting,  
Geol. Soc. Am., Abstr. Vol. 6, No. 3, p. 288, 1974  
CODFN: GAAPBC

Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; \*Earthquakes; Geologic hazards; Prediction; Probability; models  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

714831 74-19965

Statistical analysis of low-rise building damage caused by the San Fernando earthquake

Scholl, Roger E.  
Seismol. Soc. Am., Bull. Vol. 64, No. 1, p. 1-23, illus. (incl. sketch maps), 1974  
CODFN: BSSAAP

Doc Type: SERIAL  
Languages: English  
Descriptors: \*California; \*Engineering geology; \*Earthquakes; United States; San Fernando; Glendale; 1971; effects; ground motion; buildings; damage; analysis; statistical methods; Los Angeles County  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

714731 74-19865

Earth hazards

Hill, Mary R.  
Calif. Div. Mines Geol., Miner. Inform. Serv. Vol. 18, No. 4, p. 57-59, 1965  
CODFN: CDMJAR

Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; Geologic hazards; Disasters; statistics; global  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

712661 74-17795

A numerical classification of selected landslides of the debris slide-avalanche-flow type

Blong, R. J.  
Eng. Geol., Vol. 7, No. 2, p. 99-114, illus., 1973

CODFN: EGGDAD

Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*New Zealand; \*Engineering geology; \*Geomorphology; Slope stability; Mass movements; Landslides; North Island; debris slide; avalanches; flows; graywacke; classification; statistical methods; Australasia  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

711542 74-16676

Complete Comparator Calibration

Fritz, Lawrence W.  
U. S. Dep. Commer., Natl. Oceanic Atmos. Admin., Tech. Rep. No. NDS 57, 96 p., illus., 1973  
CODFN: NDAAB6

Doc Type: SERIAL  
Languages: English  
Discussion of statistics for photogrammetric grid system, computer program in Fortran  
Descriptors: \*Oceanography; \*automatic data processing; \*Engineering geology; Methods; Statistical methods; photogrammetry; grids; comparator calibration; programs; Fortran  
Section Headings: 07 (MARINE GEOLOGY AND OCEANOGRAPHY)

710290 74-15424

Stress analysis and slope stability in strain-softening materials [discussion]

Menzies, B. K.  
Geotechnique Vol. 23, No. 4, p. 595-596, 1973  
CODFN: GINDAR

Subfile: B  
Doc Type: SERIAL  
Languages: English  
For reference to paper by K. Y. Lo and C. F. Lee, see Geotechnique, Vol. 23, No. 1, p. 1, 1973  
Descriptors: \*Engineering geology; Slope stability; Theoretical studies; failure; stress; statistical methods; automatic data processing  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 708496 74-13616  
The statistical estimation of earthquake risk  
Vere-Jones, D.  
N. 2. Soc. Earthquake Eng., Bull., Vol. 6, No. 3, p. 122-127  
1973  
CODEN: NZEBA3  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; Earthquakes; Seismic risk; prediction; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 707952 74-13070  
Discussion of B. Kostak and M. U. Bielenstein's paper  
"Strength Distribution in Hard Rock"  
Glushko, V. T.; Rubets, G. T.  
Int. J. Rock Mech. Min. Sci., Vol. 10, No. 6, p. 763-766,  
illus. 1973  
CODEN: IJRM2  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
For original paper see Int. J. Rock Mech. Min. Sci., Vol. 8,  
p. 501-521, 1971  
Descriptors: \*Engineering geology; Rock mechanics; Strength; deformation; distribution; statistical method  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 707551 74-12668  
Ku studiu inzhiniersko-geologickej rovnomernosti fyzikalnych vlastnosti hornin  
A study of the engineering-geological homogeneity of the physical properties of rocks  
Modlitba, Igor.  
Mineral. Slovaca Vol. 2, No. 8, p. 315-322 (incl. Fr., Engl. sum.), 1970  
CODEN: MSLO81  
Subfile: B  
Doc Type: SERIAL  
Languages: Slovakian  
Descriptors: \*Engineering geology; Rock mechanics; Physical properties; homogeneity; investigation; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 706994 74-12111  
The Northridge Hills and Associated Faults: A Zone of High
- Seismic Probability?  
Barnhart, John T.; Slosson, James E.  
In Geology, seismicity, and environmental impact, p. 253-256, sketch map.  
Assoc. Eng. Geol., Los Angeles, 1973  
Subfile: B  
Languages: English  
Descriptors: \*California; \*Engineering geology; \*Faults; \*Geologic hazards; Distribution; San Fernando Valley; Northridge Hills Fault; displacements; earthquakes; possibilities; Patterns; seismicity; south; Los Angeles County  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 706014 74-11131  
O zavislosti mezdu soprotivleniyem sdvigu i vertikal'nym davleniyem lessovykh porod na territorii g. Tashkenta  
Relationship between shear strength and vertical pressure in loessal rocks of the Tashkent region  
Aliyev, N. A.; Khudaybergenov, A. M.  
in Seysmologiya i seysmogeologiya Uzbekistana, p. 179-186, Akad. Nauk Uz. SSR, Inst. Seysmol., Tashkent, 1971  
Subfile: B  
Languages: Russian  
Equations for calculating viscosity and cohesion, values of shear strength for pressures 0.1-3.0 kg/cm.2.  
Descriptors: \*USSR; \*Engineering geology; \*Soils; Soil mechanics; Engineering properties; Uzbekistan; Tashkent; Shear strength; loess; relation; pressure; vertical; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

700432 74-11129  
Statisticheskaya obrabotka rezul'tatov opredeleniya  
soprotivleniya sdvigu tessonnykh porod na territorii g.  
Tashkenta  
Statistical analysis of data on shear strength of loessal  
rocks in Tashkent  
Aliyev, N. A.; Khudaybergenov, A. M.

700433 74-05535  
Prediction of peak ground motion from earthquakes [abstr.]  
Diphal, D. L.; Lahoud, J. A.  
Earthquake Notes Vol. 44, No. 1-2, p. 57. 1973  
CODEN: EAGNAT  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; \*Earthquakes; Effects  
; Statistical methods; prediction; acceleration;  
attenuation; distance; focus; magnitude; comparison;  
nuclear explosions; Ground motion  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

700432 74-05534  
Statistical interpretation of earthquake duration  
Singh, J. P.; Donovan, N. C.  
Earthquake Notes Vol. 44, No. 1-2, p. 56-57. 1973  
CODEN: EAGNAT  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; \*Earthquakes; effects  
; Statistical methods; determination; duration; strong  
motion; distance; epicenters; soils; applications;  
construction; magnitude; mechanism  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

703143 74-08247  
Vvedeniye v teoriyu geologicheskogo podobiya i  
modelirovaniya (Primeneniye prirodnykh analogov i  
kolichestvennykh kriteriyev podobiya v geologii)  
Introduction to theory of geologic similarity and natural  
modelling; applications of natural analogs and quantitative  
criteria of similarity in geology  
Rozovskiy, L. B.  
Izd. Nedra 128 p., illus., Moscow, 1969  
Subfile: B  
Languages: Russian  
Classification of analogs and models, equations and  
parameters, methods defining dimensions of similarity for use  
in prediction, examples of applications: shoreline erosion,  
rates of sedimentation, slope stability, mineral exploration;  
flow scheme for automatic data processing  
Descriptors: \*Mathematical geology; \*engineering geology;  
\*geomorphology; \*mineral exploration; Textbooks; Landform  
evolution; Slope stability; Statistical methods  
Similarity theory; concepts; models; applications;  
Quantitative geomorphology; erosion; rates; Prediction;  
methods; similarity theory; Theoretical studies  
Section Headings: 15 (MISCELLANEOUS & MATHEMATICAL GEOLOGY)

703119 74-08223  
Statistical correlation of observed ground motion with  
low-rise building damage  
Scholl, Roger E.; Parhoomand, Iraj.  
Seismol. Soc. Am., Bull. Vol. 63, No. 5, p. 1515-1537.  
IITUS. (incl. sketch map). 1973  
CODEN: BSSAAP  
Subfile: B  
Doc Type: SERIAL  
Languages: English

700414 74-05516

**Likelihood of strong-motion earthquakes [abstr.]**

Chou, I. H.; Yao, J. T. P.; Zimmer, W. J.  
 Earthquake Notes Vol. 44, No. 1-2, p. 47-48. 1973  
 CODEN: EAQNAI

Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Earthquakes; \*Engineering geology;  
 Prediction: Statistical methods; mathematical models;  
 strong motion  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

700413 74-05515

**Time criteria, risk, classification of fault activity & time-criteria risk [abstr.]**

Taylor, Charles L.; Brogan, George E.; Cluff, Lloyd S.  
 Earthquake Notes Vol. 44, No. 1-2, p. 47. 1973  
 CODEN: EAQNAI

Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Environmental geology;  
 Geologic hazards; Land use; Statistical methods;  
 classification; faults; movement; time; applications;  
 construction  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

700412 74-05514

**Average regional seismic hazard index (ARSHI) [abstr.]**

Howell, B. F., Jr.  
 Earthquake Notes Vol. 44, No. 1-2, p. 46-47. 1973  
 CODEN: EAQNAI

Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*United States; \*Seismology; \*Earthquakes;  
 \*Engineering geology; Prediction; Great Plains;  
 California; Coast Ranges; Statistical methods; seismic risk  
 ; seismicity; geologic hazards  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

700410 74-05512

**Distance attenuation of response spectral data from underground nuclear detonations [abstr.]**

Lynch, R. D.  
 Earthquake Notes Vol. 44, No. 1-2, p. 46. 1973  
 CODEN: EAQNAI

Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Nevada; \*Engineering geology; Nuclear  
 explosions; Pahute Mesa; Yucca Flat; Spectra; response;  
 attenuation; distance; statistical methods; United States  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

698125 74-03228

**A statistical study on the determination of the standard seismic intensity**

Li, Chi-pin.  
 Sci. Geol. Sinica No. 3, p. 250-256 (Chin.; Engl. sum.).  
 illus., 1973  
 CODEN: SGSIAG

Subfile: B  
 Doc Type: SERIAL  
 Languages: Chinese  
 Descriptors: \*Engineering geology; \*earthquakes; \*Seismology  
 ; Magnitude; Construction; seismicity; intensity;  
 analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

692978 73-32260

**Procedures Used for Sampling Fracture Orientations in an Underground Coal Mine**

Bolstad, D. O.; Alldredge, J. R.; Mahteb, M. A.  
 U. S. Bur. Mines, Rep. Invest. No. 7763, 9 p., illus.  
 (incl. sketch maps). 1973  
 CODEN: XRMIAG

Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Statistical methods, engineering properties of sedimentary  
 rocks, effects of fractures on roof stability, Pennsylvania,  
 Permian, Greensboro, Pennsylvania  
 Descriptors: Pennsylvania; \*Engineering geology; \*fractures  
 ; \*Automatic data processing; \*Paleozoic; \*sedimentary rocks;  
 \*Mining geology; Rock mechanics; United States; \*Clastics;  
 terrigenous; Distribution; Technology; Experimental  
 studies; Greensboro; Statistical methods; orientations;  
 coal; underground; Methods; engineering properties;  
 Pennsylvania; Permian; Sandstone; shale; stability  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

- 692606 73-31887  
 Simulation der Flüssigkeits- und Gasströmung in deformierbaren porösen Gesteinen unter Berücksichtigung der Abweichung vom Darcy-Gesetz; (Teil I-III); Teil I. Ermittlung der petrophysikalischen Parameter des Gesteins und deren Abhängigkeit von Ueberlagerungs- und Porenraumdruck; Ausgangsdaten fuer die mathematische Modellierung  
 with reference to the deviation from Darcy's law; (Parts 1-3); Part 1. Determination of the petrophysical rock parameters and their dependence on the overburden and pore pressure; initial data for mathematical modeling  
 Hoeg, Werner; Haefner, Frieder; Foerster, Siegfried; Voigt, Hans Dieter.  
 Z. Angew. Geol., Vol. 19, No. 4, p. 168-174 (incl. Russ.). Engl. sum. 1 illus., 1973  
 CODEN ZANGAK  
 Subfile B  
 Doc Type SERIAL  
 Languages German  
 Descriptors: \*Engineering geology; Reservoirs; Models; statistical methods; porosity; permeability; pore pressure; overburden pressure; equations; sandstone; Darcy's law; deviation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 688620 73-27899  
 Analisis numerico de un medio rocoso elastoplastico  
 Numerical analysis of an elastoplastic rock medium  
 Canizo Perate, L. del; Sagaseta Millan, C.  
 In Geologia del Ingeniero, Congr. Hisp.-Luso-Am. Geol. Econ., [Trab.] No. 1, Secc. 5, p. 197-201, illus., 1971  
 CODEN 26ZYAX  
 Subfile B  
 Doc Type SERIAL  
 Languages Spanish  
 Descriptors: \*Engineering geology; \*Deformation; Rock mechanics; Experimental studies; statistical methods; Elasticity; plasticity; rocks; analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 687546 73-26825  
 Statisticheskaya model' poristoy sredy dlya opredeleniya elektro- i gidrosoprotivleniya  
 Statistical model of a porous medium; its application to the determination of electrical and hydrologic resistivities [abstr.]  
 Zaydel', A. R.; Dynkina, O. Ye.  
 Mosk. Obo. Ispyt. Priro., Byull., Otd. Geol., Vol. 48, No. 1, p. 149-150, 1973  
 CODEN BMPGAK  
 Subfile B  
 Doc Type SERIAL  
 Languages Russian  
 Descriptors: \*Engineering geology; Materials; properties; Rocks; porosity; relation; permeability; electrical properties; models; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 689900 73-29180  
 Metodos matematicos en geologia aplicada  
 Mathematical methods in applied geology  
 Jimenez Salas, J. A. (ed.)  
 Congr. Hisp.-Luso-Am. Geol. Econ., Comun. (Relatos)--Comun. (Relatos) No. 1, p. 281-286, 1971  
 CODEN 27ZBA5  
 Subfile B  
 Doc Type SERIAL  
 Languages Spanish  
 Summation of several papers  
 Descriptors: \*Engineering geology; Methods; Statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 688728 73-28007  
 A Coupled Stress-Flow Method of Analyzing Effects of Fluid Injection on Stress Distribution in Fractured Rocks [abstr.]  
 Witherspoon, P. A.; Taylor, R. L.; Maini, Y. N. T.; Gale, J. F.; Ayatollahi, M. S.  
 EOS (Am. Geophys. Union, Trans.) Vol. 54, No. 1, p. 769, 1973  
 CODEN E07  
 Subfile B  
 Doc Type SERIAL

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

687081 73-26360

Analiz modely raspredeleniya pokazateley mekhanicheskikh svoystv gruntov v massive  
**Analysis of models of mechanical property parameter distribution studied for soil layers**

Titova, L. M.  
 Moscow, Univ., Vestn., Ser., Geol. Vol., 27, No. 1, p. 114-117, illus., 1972

CODEN: VMUGAR  
 Subfile: R  
 Doc Type: SERIAL  
 Languages: Russian  
 Descriptors: \*Engineering geology; Materials; properties  
 : Clay; layers; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

686834 73-26113

**Les cartes de localisation probable des avalanches  
 Probable avalanche location maps**

Cazabat, Charles.  
 Soc. Fr., Photograph., Bull., No. 48, 41 p. (incl. Engl., Ger., sum.), illus., 1972

CODEN: BFGA5  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: French  
 Geologic hazards; photointerpretation; France  
 Descriptors: \*France; \*Engineering geology; \*maps; \*Geomorphology; Geologic hazards; Cartography; Mass movements; Alps; Pyrenees; Avalanches; photogeology; probability; Europe  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

686802 73-26081

**Les caracteristiques hydrauliques du massif de fondation du barrage de Grand-Maison (Isere)  
 The hydraulic characteristics of the foundation of the Grand-Maison Dam, Isere, France**

Louis, Cl.  
 Fr., Bur., Rech., Geol. Minieres, Bull. (Ser. 2), Sect. 3 No. 4, p. 13-37, illus. (incl. geol. sketch map), 1972

CODEN: FBBHAM  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: French  
 Site geology; fractures; water situation; hydraulic conductivity; models  
 Descriptors: \*France; \*Engineering geology; \*fractures; Dams; Distribution; foundations; Isere; Grand Maison Dam; hydraulics; stability; models; Patterns; analysis; statistical methods; Europe

686306 73-25585

**Determination of the Center of the Distribution of Collapsed Houses**

Sato, Yasun; Kotake, Yoshiko.  
 Zisin (Seismol. Soc. Jap., J) Vol., 25, No. 3, p. 254-262 (Jap.; Engl. sum.), sketch maps, 1972

CODEN: ZISIA5  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: Japanese  
 Theoretical studies; least-squares analysis; destruction related to focal depth  
 Descriptors: \*Earthquakes; \*Engineering geology; \*Seismology; Effects; Theoretical studies; statistical methods; relation; hypocenters; epicenters; least-squares analysis; buildings; damage  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

683055 73-22332

**Examinarea statistica a indicelui de consistenta a rocilor argiloase  
 Statistical study of the liquefaction index of clays**

Florea, Mircea; Popovici, Alina; Boboc, Justin.  
 Rom., Inst. Pet. Gaze Geol., Bul., Geol. Teh., Vol., 19, p. 39-45 (incl. Engl., Russ. sum.), illus., 1972

CODEN: BTPGAO  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: Romanian  
 Descriptors: \*Engineering geology; \*Romania; \*Cenozoic; Materials; properties; Europe; Clays; shale; Liquefaction; index; upper Cenozoic  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

682873 73-22150

**Verfahren zur Bestimmung des Benetzungszustands des Speicheresteins in Erdoelagierstaetten**  
**Method for determining the oil wetting state of reservoir rocks**

Ehrhse, Walter.  
Z. Angew. Geol., Vol. 19, No. 2, p. 86-88 (incl. Russ., Engl. sum.), illus., 1973  
CODEN: ZANGAK  
Subfile: B  
Doc Type: SERIAL  
Languages: German  
Statistical method  
Descriptors: \*Engineering geology; \*Petroleum; Reservoirs; properties; wetting; analysis; statistical methods; measurement  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

681904 73-21180

**Stress analysis and slope stability in strain-softening materials**

Lo, Kuan Yee; Lee, Chack fan.  
Geotechnique Vol. 23, No. 1, p. 1-11 (incl. Fr. sum.), illus., 1973  
CODEN: GINGAB  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Computer programs (finite element)  
Descriptors: \*Automatic data processing; \*Engineering geology; \*Reformation; Slope stability; Theoretical studies; stress; analysis; failure; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

680013 73-19288

**The origin of porosity in sandstones**

Knoring, L. D.  
Acad. Sci. USSR, Dokl., Earth Sci. Sect., Vol. 201, No. 1-6, p. 223-225, illus., 1972  
CODEN: DKESAG  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Sedimentary rocks; \*Engineering geology; textures; porosity; analysis; Materials; Sandstone; genesis  
Section Headings: 06 (PETROLOGY, SEDIMENTARY)

676850 73-16125

**NMR Relaxation of <sup>7</sup>Li and <sup>1</sup>H in Appalachian Petroleum Reservoir Rocks Containing LiCl Solution**

Headley, L. C.  
Nature: Phys. Sci., Vol. 242, No. 119, p. 87-88, illus., 1973  
CODEN: NPSCA6  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Experimental studies, statistical analysis, sandstone cores  
Descriptors: \*Appalachians; \*Petroleum; \*Engineering geology; \*Economic geology; North America; Materials; properties; reservoir rocks; permeability; indicators; experimental studies; nuclear magnetic resonance; sandstone; cores; statistical methods; automatic data processing  
Section Headings: 26 (ECONOMIC GEOLOGY, GENERAL & MINING)

674816 73-14087

**Probabilistic Analysis of Seepage**

Wu, Tien H.; Vyas, Shyam K.; Chang, Nien-Yin.  
Am. Soc. Civ. Eng., Proc., J. Soil Mech. Found., Div., Vol. 99, No. SM4, p. 323-340, illus. (incl. sketch maps), 1973  
CODEN: JSFEAQ  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Alluvial deposits, aquifers, fluvial hydraulics, glacial deposits, models, statistics, soil mechanics, Mississippi River  
Descriptors: \*United States; \*Engineering geology; Seepage; Mississippi River; Analysis; statistical methods; soil mechanics; aquifers  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

67J72 73-13043  
 Zakonomnosti prostranstvennoy izmenchivosti svoystv porod i ikh ispol'zovaniye v inzhenernoy geologii  
 Regularities of spatial variability in properties of rocks and their use in engineering geology  
 Bondartsk., G. K.

in Gidrogeologiya i inzhenernaya geologiya (Doklady Sovetskikh Geologov),  
 Int. Geol. Congr., Proc., Congr. Geol. Int., Programme No. 24, p. 93-101 (incl. Engl. sum.), illus., 1972  
 CODEN: ICGGAD  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: Russian  
 Rep. Sov. Geol., Sect. 11, 13, Symp. 1, Izd. Nauka, Moscow.  
 Descriptors: \*Engineering geology; \*Materials; \*properties  
 Changes: spatial; prediction; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

672005 73-11275  
 Approximate Solution for Unconfined Seepage  
 Desai, Chandrakant S.  
 Am. Soc. Civ. Eng., Proc., J. Irrig. Drain. Div., Vol. 99, No. 171, p. 71-86, illus., 1973  
 CODEN: JRC6A4  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Drainage, finite element method, free surfaces, numerical analysis, one-dimensional flow, transient flow  
 Descriptors: \*Engineering geology; \*Seepage; \*Flow; drainage, unconfined; analysis; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

668454 73-07718  
 Methodische Untersuchungen zur Charakterisierung von Speichergesteinen auf mathematisch-statistischer Grundlage  
 Characteristics of reservoir rocks on a statistical basis  
 Rasemann, Winfried.  
 Dtsch. Geol. Wiss., Ber., Reihe A, Geol. Paläontol. Vol. 17, No. 1, p. 49-58, illus., 1972  
 CODEN: BDCRA7  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: German  
 porosity and permeability of Buntsandstein, models, analogs, Germany  
 Descriptors: \*Germany; \*Engineering geology; \*Sedimentary rocks; \*Triassic; \*Reservoirs; \*Clastics; \*extrigenous; Europe; \*Thuringian forest; Engineering properties;

porosity; permeability; models; Sandstone; analysis; statistical methods; Runter  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

668115 73-07379  
 Finite Element Analysis of Crack Initiation in a Block Model Experiment  
 De Rouvray, A. L.; Goodman, R. E.  
 Rock Mech., Vol. 4, No. 4, p. 203-223 (incl. Ger., Fr. sum.), illus., 1972  
 CODEN: RMFMAS  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Fractures; \*Deformation; \*Rock mechanics; Experimental studies; Style; models; Joints; finite element analysis; stress; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

666126 73-05391  
 Stratigraphic Succession and the Physico-mechanic Nature of 'Kvanto Lom', Detected by means of R. I. Logging  
 Kanai, Takao.  
 Jap. Geol. Surv., Bull., Vol. 23, No. 1, p. 15-35 (Jap.; Engl. sum.), illus. (incl. sketch maps), 1972  
 CODEN: JGS6AW  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: Japanese  
 Gamma ray and neutron logging, soil mechanics, Japan  
 Descriptors: \*Japan; \*Geophysical surveys; \*Soils; \*Engineering geology; \*Quaternary; \*Igneous rocks; \*Radioactivity surveys; Asia; soil mechanics; Engineering properties; Pyroclastics and glasses; Honshu; Kwantou; Shimosa; Omiya; ground; volcanic ash; Interpretation; Lithostratigraphy; statistical methods  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

663797 73-03062

**Analysis of rock slopes using the finite element method**

Yu, Y. S.; Coates, D. F. *Energy Mines Resour., Mines Br., Res. Rep. No. 229, 74 p. (with Fr. sum.), illus., 1971*  
CODEN: CMRRCB  
Subfile: B

Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; \*Deformation; Slope stability; Theoretical studies; Rock mechanics; Statistical methods; Stress  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

663103 73-02368

**Analysis of Completeness of the Earthquake Sample in the Puget Sound Area and Its Effect on Statistical Estimates of Earthquake Hazard**  
Stopp, J. C.

*In Microzonation Conference, Vol. 2, p. 897-909, illus. (incl. sketch map), Wash., Univ. Seattle, 1972*  
Subfile: B

Languages: English  
1870-1969, fitting frequency formula to biased samples, Washington  
Descriptors: \*Washington; \*Engineering geology; \*Earthquakes; \*Puget Sound; \*United States; \*History; \*Seismology; \*distribution; frequency  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

663085 73-02350

**Forecasting the risk inherent in earthquake resistant design**  
Shah, H. C.; Vagliente, V. N.

*In Microzonation Conference, Vol. 2, p. 693-707, illus., Wash., Univ. Seattle, 1972*  
Subfile: B

Languages: English  
Probability of earthquake occurrence, Markov Chain model, San Francisco Bay, California  
Descriptors: \*California; \*Engineering geology; \*Earthquakes; \*United States; San Francisco Bay; Geologic hazards; Probability; Statistical methods; occurrence  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Damage and risk analysis for the Greater San Francisco Bay area due to earthquake loading**  
Shah, Hareesh C.; Datal, Jagat S.

*In Microzonation Conference, Vol. 2, p. 671-682, illus. (incl. sketch maps), Wash., Univ. Seattle, 1972*  
Subfile: B

Languages: English  
Seismicity, probabilities of peak ground acceleration as function of time, ground motion frequency, seismic load criteria, California  
Descriptors: \*California; \*Engineering geology; \*Earthquakes; \*Seismology; \*United States; San Francisco Bay; Geologic hazards; seismicity; statistical methods; effects; ground motion  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

663082 73-02347

**Statistical analysis of 1971 San Fernando earthquake ground-motion data**  
Liu, S. C.

*In Microzonation Conference, Vol. 2, p. 651-662, illus., Wash., Univ. Seattle, 1972*  
Subfile: B

Languages: English  
Correlation, amplification and attenuation statistics, estimation procedures, California  
Descriptors: \*California; \*Engineering geology; \*Earthquakes; \*United States; San Fernando; Effects; ground motion; statistical methods; 1971  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

663084 73-02349

662695 73-01960  
Influence of Topography on the Pre-Mining State of Stress  
Pariseau, V. G.  
Can. Rock Mech. Symp., Proc. No. 7, p. 191-195, illus.,  
1972  
CODEN: PCRSBF  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Finite element technique, simulated erosional sequence,  
non-uniform stress  
Descriptors: \*Engineering geology; \*Deformation; \*mining  
geology; \*geomorphology; \*Experimental studies; Landform  
evolution; Methods; Stress; Topography; models;  
statistical methods; applications  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

662696 73-01960  
Estimating the Strength of Jointed Soils  
Lumb, P.  
Aust. N.Z. Conf. Geomech., Proc. No. 1, p. 175-179,  
illus., 1971  
CODEN: PAZCAO  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Residual soils, sampling, shear strength, statistical  
analysis, examples from Hong Kong  
Descriptors: \*Engineering geology; \*Hong Kong; \*Fractures;  
\*Deformation; \*Soil mechanics; Style: Field studies;  
Statistical methods; Asia joints; soils; shear strength;  
fracture strength; 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

662697 73-01960  
Estimating the Strength of Jointed Soils  
Lumb, P.  
Aust. N.Z. Conf. Geomech., Proc. No. 1, p. 175-179,  
illus., 1971  
CODEN: PAZCAO  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Residual soils, sampling, shear strength, statistical  
analysis, examples from Hong Kong  
Descriptors: \*Engineering geology; \*Hong Kong; \*Fractures;  
\*Deformation; \*Soil mechanics; Style: Field studies;  
Statistical methods; Asia joints; soils; shear strength;  
fracture strength; 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

662698 73-01960  
Estimating the Strength of Jointed Soils  
Lumb, P.  
Aust. N.Z. Conf. Geomech., Proc. No. 1, p. 175-179,  
illus., 1971  
CODEN: PAZCAO  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Residual soils, sampling, shear strength, statistical  
analysis, examples from Hong Kong  
Descriptors: \*Engineering geology; \*Hong Kong; \*Fractures;  
\*Deformation; \*Soil mechanics; Style: Field studies;  
Statistical methods; Asia joints; soils; shear strength;  
fracture strength; 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

662699 73-01956  
A Study of the Causes of Roof Instability in the Pittsburgh  
Coal Seam  
Parsons, Roger C.; Dehl, H. D.  
Can. Rock Mech. Symp., Proc. No. 7, p. 79-89, illus.,  
1972  
CODEN: PCRSBF  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Geological factors, geometrical factors, discriminant  
analysis, regression analysis, regional stress field, finite  
element analysis, West Virginia  
Descriptors: \*West Virginia; \*Engineering geology;  
\*Deformation; Land subsidence; Field studies; north;  
tunnels; rock mechanics; Compaction; statistical methods;  
coal; United States  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

662700 73-01802  
Parametria terenurilor nisipoase si importante ei in  
problemele de drenaj  
Sandey ground pore-size distribution and its significance in  
drainage problems  
George, Alex.  
Rom. Inst. Pet. Gaze Geol., Bul., Geol. Teh. Vol. 18  
(1971), p. 61-75 (incl. Engl., Russ. sum.), illus., 1972  
CODEN: BIPGAG  
Subfile: B  
Doc Type: SERIAL  
Languages: Romanian  
Suction and thin section studies, structural factors,  
statistical methods, ground water  
Descriptors: \*Engineering geology; Materials; properties

662701 73-01368  
A Statistical Method for the Design of Rock Slopes  
McMahon, B. K.  
Aust. N.Z. Conf. Geomech., Proc. No. 1, p. 314-321,  
illus., 1971  
CODEN: PAZCAO  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Joints, statistical analysis, slope stability, probability  
of failure  
Descriptors: \*Engineering geology; \*Fractures; Slope  
stability; Style; Rock mechanics; joints; statistical  
methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

662702 73-01368  
A Statistical Method for the Design of Rock Slopes  
McMahon, B. K.  
Aust. N.Z. Conf. Geomech., Proc. No. 1, p. 314-321,  
illus., 1971  
CODEN: PAZCAO  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Joints, statistical analysis, slope stability, probability  
of failure  
Descriptors: \*Engineering geology; \*Fractures; Slope  
stability; Style; Rock mechanics; joints; statistical  
methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

662703 73-01368  
A Statistical Method for the Design of Rock Slopes  
McMahon, B. K.  
Aust. N.Z. Conf. Geomech., Proc. No. 1, p. 314-321,  
illus., 1971  
CODEN: PAZCAO  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Joints, statistical analysis, slope stability, probability  
of failure  
Descriptors: \*Engineering geology; \*Fractures; Slope  
stability; Style; Rock mechanics; joints; statistical  
methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

660883 73-00145  
**Numerical statistics in engineering geology**  
 Muspratt, M. A.  
 Eng. Geol., Vol. 6, No. 2, p. 67-78, illus., 1972  
 CODEN: EGGDAD  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Factor analysis, categorization, pattern-recognition  
 algorithm, Monte Carlo simulation, applications  
 Descriptors: \*Engineering geology; \*automatic data  
 processing; Methods; Statistical methods; models;  
 simulation; applications; factor analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

657767 72-39089  
**On the statistical seismic design determining the optimum  
 dynamic characteristics of structure (continued)**  
 Kobori, Takuji; Mizui, Ryochiro; Kawano, Masahiro.  
 Kyoto Univ., Disaster Prev. Res. Inst., Ann. No. 14A, p.  
 315-332 (Jap.; Engl. sum.), illus., 1971  
 CODEN: KDBKAW  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: Japanese  
 Descriptors: \*Engineering geology; \*Earthquakes; Effects  
 buildings; models; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

657218 72-38540  
**Un metodo grafico per la valutazione della franosita  
 Graphic method to determine the regional landslide  
 probability**  
 Lucini, Paolo.  
 Naples, Univ., Ist. Geol. Appl., Mem. Note Vol. 11, Part 1,  
 14 p. (incl. Engl. sum.), illus., 1969  
 CODEN: MGANAB  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: Italian  
 Method based on comparison of geologic and slope maps  
 Descriptors: \*Engineering geology; Slope stability;  
 Landslides; prediction; methods; interpretation  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

657094 72-38416  
**O moziwosciach stosowania metody elementow si onczonych w  
 mechanice gorolwory**

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657094 72-38416  
**O moziwosciach stosowania metody elementow si onczonych w  
 mechanice gorolwory**

653793 72-35103  
**Development of the Saskatchewan Computerized Well  
 Information System, 1964-1971**  
 Buller, J. V.

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 Buller, J. V.

653793 72-35103  
**Development of the Saskatchewan Computerized Well  
 Information System, 1964-1971**  
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652252 72-33561

Interpretation statistique des essais en laboratoire sur les roches

Statistical interpretation of laboratory tests on rocks [with discussion]

Robinson, E. Y.; Finnie, L.

in Colloque de geotechnique, p. [1]87-104 (incl. Fr. sum.).

Int. Natl. Sci. Appl. Toulouse, 1971

Subfile: B

Languages: French

Extreme-flaw theory of brittle failure, Weibull Distribution, applications to genesis of fractures, models  
Descriptors: \*Engineering geology; \*deformation; \*fractures  
; Rock mechanics; theoretical studies; Genesis; Flaws; extreme; statistical methods; models; applications  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

651413 72-32722

Informatii suplimentare cu privire la terenul loessoid de pe fondul existent de date geotehnice

Additional information about a loess soil from a city, geotechnical data

Bally, R. J.; Martian, Felicia; Iordache, Gh.

Rom. Inst. Cercet. Imbinatatiri Funciare Pedol., An. Ser. Hidroteh. Vol. 3 (1969), p. 287-311 (incl. Engl., Fr., Russ. sum.), illus., 1970

CODEN: AIJHBI

Subfile: B

Doc Type: SERIAL

Languages: Romanian

Descriptors: \*Soils; \*automatic data processing; Engineering geology; Engineering properties; loess; Soil mechanics; Europe

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

650938 72-32247

The development of a computerized well information system, 1964-1971 [abstr.]

Buller, John V.

Int. Geol. Congr. Abstr.--Congr. Geol. Int., Resumes No. 24, p. 456, 1972

CODEN: IGABBY

Subfile: B

Doc Type: SERIAL

Languages: English

Descriptors: \*Well-logging; \*Automatic data processing; \*Saskatchewan; \*Mineral resources; \*Economic geology; \*Mineral

exploration; General; Canada; Methods; Statistical methods; Engineering geology; Systems  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

646340 72-27582

Some thoughts on estimating spillway design flood

Biswas, Asit K. Hydrol., Bull. Vol. 16, No. 4, p. 63-72 (incl. Fr. sum.), 1971

CODEN: BIAHAM

Subfile: B

Doc Type: SERIAL

Languages: English

Descriptors: \*Engineering geology; Dams; Spillways; design; theoretical studies; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

645067 72-26300

Statistical Relationships Between Geotechnical Properties of Gulf of Mexico Sediments

Bryant, William R.; Trabant, Peter K.

In Offshore Technology Conference, Fourth Annual, Preprints, Vol. 2, p. 383-386, illus. (incl. sketch map),

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Subfile: B

Languages: English

Descriptors: \*Gulf of Mexico; \*Engineering geology; \*Sediments; Materials; Properties; Engineering properties  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

643175 72-24408

Statistical Approximation for Consolidation Settlement

Elnaggar, Mameed A.; Krizek, Raymond J.

Highw. Res. Rec. (Nat. Res. Councl.-Nat. Acad. Sci.-Nat. Acad. Eng. Publ.) No. 323, p. 87-96, illus., 1970

CODEN: HJRRAX

Subfile: B

Doc Type: SERIAL

Languages: English

Descriptors: \*Engineering geology; Soil mechanics; Consolidation; analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

639513 72-20720

**Statistical approach to the selection of the optimum dimensions of retaining walls**

Klein, G. K.; Karavaev, V. N.  
Soil Mech. Found. Eng. (New York, Engl. Ed.) Vol. 8, No. 1, p. 1-4, illus., 1971  
CODEN: SMFEAF  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Translated from Osnovaniya, Fundamenty i Mekhanika Gruntov, No. 1, p. 1-3, 1971  
Descriptors: \*Engineering geology; Methods; Foundations; statistical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

636962 72-18099

**Two-variate Exponential Distribution and Its Numerical Table for Engineering Application**

Nagao, Masashi; Kadoya, Mutsumi.  
Kyoto Univ., Disaster Prev. Res. Inst., Bull., Vol. 20, Part 3, p. 183-215, illus., 1971  
CODEN: DPKBAN  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Theoretical studies, possible applications in river engineering, flood control, water resource management  
Descriptors: \*Hydrogeology; \*Engineering geology; \*water resources; Methods; Statistical methods; distribution;  
two-variate; applications  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

636956 72-18093

**Probability of Levee Breaks Due to Heavy Rainfalls in a River**

Ishihara, Yasuo; Seno, Kunio.  
Kyoto Univ., Disaster Prev. Res. Inst., Bull., Vol. 20, Part 1, p. 37-50, illus., 1970  
CODEN: DPKBAN  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Engineering geology; Theoretical studies; Levees; breaks; prediction  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Bed load transport as a probability problem**

Einstein, Hans Albert.  
In Sedimentation, Privately published [C] 105 p., illus., Fort Collins, Colorado, 1972  
Subfile: B  
Languages: English  
Experimental studies, sediments, mathematical treatment; English translation of D.Sc. thesis, Federal Institute of Technology, Zurich, Switzerland, 1937  
Descriptors: \*Engineering geology; \*Hydrogeology; \*Sediments; \*Sedimentation; Waterways; transport; Concepts; Flow regime; Bed load; mathematical studies  
Section Headings: 06 (PETROLOGY, SEDIMENTARY)

636152 72-17242

**Earthquake-risk mapping: space photographic and statistical approaches**

Kedar, Ervin Y.; Hsu, Shin-yi.  
Am. Soc. Photogram., Proc., No. 38, p. 54-71, illus. (incl. sketch maps), 1972  
CODEN: ASPGCC  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Transverse ranges, California, case study area  
Descriptors: \*Engineering geology; \*Earthquakes; Detection; Maps; prediction; photogrammetric studies  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

635512 72-16601

**Finite element analyses of Port Allen Lock**

Duncan, James M.; Clough, G. Wayne.  
Am. Soc. Civ. Eng., Proc., J. Soil Mech. Found. Div., Vol. 97, No. 8, p. 1053-1068, illus., 1971  
CODEN: JSFEAO  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Descriptors: \*Louisiana; \*Engineering geology; Waterways; Port Allen Lock; Statistical methods; finite-element analysis; United States  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

636356 72-17446

635508 72-16597  
**Torsional stiffness of embedded footings**  
 Kaldjian, Moses J.  
 Am Soc. Civ. Eng., Proc., J. Soil Mech. Found. Div., Vol. 97, No. 7, p. 969-980, illus., 1971  
 CODEN: JSFEAQ  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Soils; Foundations; Engineering properties; Footings; stiffness; statistical methods; Soil mechanics; finite-element analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

631650 72-12732  
**A Theory for the Shear Strength of Rockfill**  
 Wilkins, J. K.  
 Rock Mech., Vol. 2, No. 4, p. 205-222 (incl. Ger., Fr., Sum J.), illus., 1970  
 CODEN: RMEFAS  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Deformation; \*Engineering geology; Theoretical studies; Rock mechanics; Shear strength; rock fill; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

631586 72-12668  
**Ein Uebertragungsnetz zur kluftstatistik  
 A transmission net for crack statistics**  
 Stawmiller, L.  
 Eng. Geol., Vol. 5, No. 4, p. 291-312 (incl. Engl., sum.), illus., 1971  
 CODEN: EGGDAD  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: German  
 Descriptors: \*Engineering geology; Rock mechanics; Methods; transmission net  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

622087 72-03136  
**Control of reservoir dimensioning, using data of representative areas**  
 Birkovszki, Gy.  
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and experimental basins-Colloque sur les resultats des recherches sur les bassins representatifs et experimentaux, Int. Assoc. Sci. Hydrol., Publ., No. 96, p. 565-570 (incl. Fr., sum.) illus., 1970  
 CODEN: IHYPAM  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Statistical methods, Hungary  
 Descriptors: \*Hungary; \*Engineering geology; \*Water resources; Reservoirs; Europe; water storage; dimensioning; statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

619980 72-01026  
**An Analysis of Selected Landslides in Alameda and Contra Costa Counties, California**  
 Waltz, J. P.  
 Assoc. Eng. Geol., Bull., Vol. 8, No. 2, p. 153-163, illus. (incl. sketch map), 1971  
 CODEN: ENGEA9  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*California; \*Engineering geology; Slope stability; Landslides; Alameda County; Contra Costa County; Statistical methods; United States  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

619978 72-01024  
**Creep Movements of an Urbanized Hillside**  
 Singh, Avtar; Cousineau, Richard P.; Lockwood, R. Bruce.  
 Assoc. Eng. Geol., Bull., Vol. 8, No. 2, p. 103-120, illus. (incl. sketch map), 1971  
 CODEN: ENGEA9  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Laboratory and field studies, soil mechanics, Ventura, California  
 Descriptors: \*California; \*Engineering geology; \*Soils; Slope stability; soil mechanics; Engineering properties; Ventura; Experimental studies; field studies; statistical methods; Creep; United States  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

619864 72-00910  
**A Class of Probability Models for Littoral Drift**  
 James, William R.

in Coastal Engineering Conference, 12th, Proc., Vol. 2, p. 831-837.  
 Am. Soc. Civ. Eng. New York, 1970  
 Subfile: B  
 Languages: English  
 Descriptors: \*Sedimentation; \*Engineering geology; Transport; Shorelines; Methods; measurement; drift; Littoral; measurements  
 Section Headings: 06 (PETROLOGY, SEDIMENTARY)

619863 72-00909  
**Processing and analysis of radioisotopic sand tracer (RIST) study data**  
 Brinshear, H. R.; Arce, E. H.; Case, F. N.; Turner, P. A.; Duane, D. B.

in Coastal Engineering Conference, 12th, Proc., Vol. 2, p. 821-830, illus.  
 Am. Soc. Civ. Eng. New York, 1970  
 Subfile: B  
 Languages: English  
 Descriptors: \*Sedimentation; \*Engineering geology; Methods; Shorelines; Statistical; computer; transport; analysis; Section Headings: 06 (PETROLOGY, SEDIMENTARY)

615736 71-35065  
**Probability of failure in earthworks [with discussion]**  
 Lumb, Peter.

in Southeast Asian Conference on Soil Engineering, 2nd, Proc., p. 139-148, illus.  
 [Asian Inst. Tech.] [Bangkok], [1971]  
 Subfile: B  
 Languages: English  
 Descriptors: \*Engineering geology; \*soils; Theoretical studies; Engineering properties; Foundations; earthworks; failure  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

614996 71-34325  
**Primeneniye korrelyatsionnogo i regressivnogo analiza dlya izucheniya sootnosheniya mezhdu skorost'yu upr. ikh voln. ploshch'yu i karbonatnost'yu gorn'nykh porod**  
 Application of correlation and regression analysis of the

study of the relationship among elastic wave velocity, density, and carbonate properties of rocks  
 Fil'shtinskiy, L. Ye.; Boyko, V. N.; Skulin, B. L.  
 Moscow, Univ. Vestn., Ser. Geol., Vol. 26, No. 1, p. 117-119, 1971  
 CODEN: VMUGAR

Subfile: B  
 Doc Type: SERIAL  
 Languages: Russian  
 Descriptors: \*Sedimentary rocks; \*Statistical methods; \*Engineering geology; Properties; Materials; Elastic; density; composition  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

613241 71-32570  
**The statistical approach to fracture permeability [abstr.]**  
 Snow, David T.  
 Geol. Soc. Am., Abstr. Vol. 3, No. 7, p. 712, 1971  
 CODEN: GAAPBC

Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*permeability; \*Statistical methods; \*fractures; Methods; Statistical; General  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

609072 71-28368

**Probleme de prevision spatiale des proprietes geologiques des roches a la base des conceptions de la theorie de la variabilite**  
 The problem of determining rock properties, based on the theory of variability  
 Bondarik, G.

Int. Assoc. Eng. Geol., Int. Congr., Proc. Vol. 2, p. 839-848 (incl. Engl. sum.), illus., 1970  
 CODEN: 002240  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: French  
 Descriptors: \*USSR; \*Engineering geology; \*Soils; \*automatic data processing; \*Statistical methods; \*Cartography; Engineering properties; Methods; Interpretation; applications; mapping; Variance analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

600079 71-28325  
 Goto, Hisao; Kameda, Hiroyuki.  
 Kyoto Univ., Disaster Prev. Res. Inst., Bull. Vol. 18, Part  
 5, p. 146, 1969  
 CODEN: DPKBAN  
 Subfile: B

Determination of geotechnical properties by geophysical measurements

Schott, J.  
 Int. Assoc. Eng. Geol., Int. Congr., Proc. Vol. 1, p.  
 301-310 (incl. fr. sum.), illus., 1970  
 CODEN: 002240  
 Subfile: B

Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Seismic methods; \*Soils; \*Seismology;  
 \*Statistical methods; \*Engineering geology; \*Applications;  
 engineering properties; Elastic waves; Experimental studies  
 Analysis; Properties  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

606428 71-25724  
 K statisticheskou opredeleniyu intensivnosti zemletryaseniy  
 The statistical determination of earthquake intensities  
 Shebalin, N. V.

In Yevropeyskaya Seysmologicheskaya Komissiya, 10th, Trudy.  
 Vol. 2, p. 71-81 (incl. Engl. sum.), illus.,  
 Akad. Nauk SSSR, Sov. Geofiz. Kom. Moscow, 1970  
 Subfile: B  
 Languages: Russian  
 Descriptors: \*Statistical methods; \*Earthquakes;  
 \*Engineering geology; \*Seismology; \*magnitude; \*Analysis;  
 Concepts: \*Statistical analysis; nomenclature  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

603256 71-22547  
 Indirect determination of equations of topographic surfaces  
 Tamas, L.  
 Acta Geod. Geophys. Mathian. Vol. 5, No. 1-2, p. 121-128  
 (incl. Russ. sum.), illus., 1970  
 CODEN: AGDMR9  
 Subfile: B

Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Geomorphology; \*automatic data processing;  
 \*Statistical methods; \*Engineering geology; \*Mathematical  
 geology; \*Methods; \*Terrain analysis; equations  
 Section Headings: 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

600421 71-19711  
 A statistical study of the maximum ground motion in strong  
 earthquakes [abstr.]

600378 71-19668  
 Numerical analyses of landslide flow [abstr.]  
 Kyunishi, Kazuo.  
 Kyoto Univ., Disaster Prev. Res. Inst., Bull. Vol. 18, Part  
 5, p. 54, 1969  
 CODEN: DPKBAN  
 Subfile: B

Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Earthquakes;  
 Prediction; \*Seismic risk; ground motion  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

595312 71-14593  
 On the statistical aseismic design determining the optimum  
 dynamic characteristics of structure [abstr.]  
 Kobori, Takuji; Minal, Ryochiro; Kawano, Masahiro.  
 Kyoto Univ., Disaster Prev. Res. Inst., Bull. Vol. 19, Part  
 5, p. 104, 1970  
 CODEN: DPKBAN  
 Subfile: B

Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Landslides;  
 Aerophotographic; \*statistical methods  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Earthquakes;  
 Construction; aseismic design  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

595294 71-14575

**Study on two-variate gamma distribution and its engineering application; fundamental theory of two-variate exponential distribution [abstr.]**  
 Nagao, Masashi; Kadoya, Mutsumi.  
 Kyoto Univ., Disaster Prev. Res. Inst., Bull., Vol. 19, Part 5, p. 64, 1970  
 CODEN: DPKRAN  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Statistical methods; Theoretical studies; applications; flood control; systems analysis; skewed distribution  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

**Mountain Arsenal waste disposal and frequency of earthquakes**  
 Bardwell, George E.

**In Engineering seismology; the works of man,**  
 Eng. Geol. Case Hist., No. 8, p. 33-37, illus., 1970  
 CODEN: ERCHAH  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Fluid Injection into fractured Precambrian gneiss reservoir, Denver area  
 Descriptors: \*Colorado; \*Engineering geology; \*Earthquakes; \*statistical methods; \*Wells and drill holes; Genesis; United States; waste disposal; Denver; Rocky Mountain Arsenal; correlation; disposal well; fluid injection; Regression analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

595281 71-14562

**Information on inflows and rule for releasing water in system of reservoirs [abstr.]**  
 Ishihara, Yasuo; Nagao, Masashi.  
 Kyoto Univ., Disaster Prev. Res. Inst., Bull., Vol. 19, Part 5, p. 44, 1970  
 CODEN: DPKBAN  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Statistical methods; Reservoirs; water release; runoff variations; Analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

593038 71-12318

**A statistical model of seismicity and an estimate of the basic seismic effects**  
 Kantorovich, L. V.; Molchan, G. M.; Keylis-Borok, V. I.; Vilkovich, E. V.  
 Phys. Solid Earth (Engl. Ed.) No. 5, p. 320-328, illus. (incl. sketch map), 1970  
 CODEN: IPSEBO  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Seismology; \*Earthquakes; \*engineering geology; Theoretical studies; Seismicity; models; statistical; statistical models; statistical model; seismic risk  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

594855 71-14136

**Seismicity and principal seismic effects**  
 Molchan, G. M.; Keylis-Borok, V. I.; Vilkovich, G. V.  
**In UIC Symposium on geophysical theory and computers,**  
 R. Astron. Soc., Geophys. J., Vol. 21, No. 3-4, p. 323-335, 1970  
 CODEN: GFOJAN  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Seismic methods; \*Earthquakes; \*Engineering geology; Techniques; Energy; Seismicity; seismic risk; statistical methods  
 Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

594353 71-13634

**Some statistical features of the relationship between rocky**

588985 71-08212

**Programowanie badan geologiczno-inzynierskich metoda MDC  
Use of MDC method--Polish variety of PERT method--in  
engineering-geologic programming**

Thiel, Kazimierz.  
Przegl. Geol., Vol. 15, No. 4, p. 175-181 (incl.). Engl.,  
Russ. sum.) illus., 1967  
CODEN: PRZGAL  
Subfile: 8  
Doc Type: SERIAL  
Languages: Polish  
Descriptors: Poland; Engineering geology; Statistical  
methods; Dams; Niedzica; Sromowce; programming; Program  
evaluation  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

587047 71-06271

**A statistical study of aftershock sequences**

Renaldi, G.  
Ann. Geofis. Vol. 22, No. 4, p. 359-397 (incl. Ital. sum.),  
illus., 1969  
CODEN: AGFRAI  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
Confirmation of time-frequency law of hyperbolic decay,  
magnitude stability law, and exponential magnitude-frequency  
distribution  
Descriptors: Earthquakes; Engineering geology; Seismology  
; Crust; Mantle; Statistical methods; Aftershocks;  
Seismic sources; General; Frequency; crustal studies;  
Statistical analysis; Movement  
Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

585095 71-04279

**Einige Gerate und Techniken fur die Rationalisierung und  
gefugestatistischer Arbeiten bei tektonischen und  
felsmechanischen Untersuchungen  
Devices and techniques for the rationalization of  
statistical measurements of fabric elements in tectonic and  
rock mechanical investigations**

Behr, H. J.  
Rock Mech. Vol. 1, No. 2-3, p. 157-163 (incl. Engl., Fr.  
sum.) illus., 1969  
CODEN: RMFMAS  
Subfile: B  
Doc Type: SERIAL  
Languages: German  
Descriptors: Petrofabrics; Engineering geology; General;  
Rock mechanics; Techniques; Instruments  
Section Headings: 16 (STRUCTURAL GEOLOGY)

583733 71-02915

**A statistical model of seismicity and an estimate of the  
basic seismic effects**

Kantorovich, L. V.; Molchan, G. M.; Keylis-Rorok, V. I.;  
Vilkovich, E. V.  
Phys. Solid Earth (Engl. Ed.) No. 5, p. 320-328, illus  
(incl. sketch map), 1970  
CODEN: JPSEBO  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
English translation of Russian article (see Fiz Zemli, No  
5, p. 85, 1970)  
Descriptors: Seismology; Earthquakes; Engineering geology  
; Theoretical studies; General; Seismicity;  
Section Headings: 18 (GEOPHYSICS, SOLID EARTH)

577528 70-29965

**The use of modal analysis in the mechanical characterization  
of rock masses**

Mendes, Fernando de Mello, Barros, L. Aires de, Rodrigues,  
F. Peres.  
Port., Lab. Nac. Eng. Civ., Mem. No. 340, 9 p (incl. Fr.,  
Ger. sum.), illus., 1969  
CODEN: LNEMAW  
Subfile: B  
Doc Type: SERIAL  
Languages: English  
(Reprinted from Int. Soc. Rock Mech., 1st Congr., Proc.,  
Vol. 1, 1966). Rock mechanics, microphotographic modal  
analysis, applications, procedures, examples (altered granite,  
gneissose granite)  
Descriptors: Engineering geology; Statistical methods;  
Rock mechanics; Methods; applications; modal analysis;  
rock characterization  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

555777 70-08208  
Ispol'zovaniye mer teorii informatsii pri otsenke svyazey i postroyeni diagnosticheskikh klassifikatsiy v inzhenernoy geologii  
The use of information theory to evaluate the relationships and structure of diagnostic classifications in engineering geology  
Komarov, I. S.; Khayme, N. M.  
Vyssh Ucheb. Zaved., Izv., Geol. Razved. No. 9, p. 86-94, illus., 1968  
Subfile B  
Doc Type: SERIAL  
Languages: Russian  
Statistical analysis  
Descriptors: \*Engineering geology; \*Statistical methods; \*Methods; \*Information theory; \*Statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

554556 70-06987  
Properties and position in lateritic ground; some statistical relationships  
Ruddock, E. C.  
In Engineering properties of lateritic soils.  
Int. Conf. Soil Mech. Found. Eng., 7th, Spec. Sess., Proc. Vol. 1, p. 11-21, illus., 1969  
Subfile B  
Doc Type: SERIAL  
Languages: English  
Variation patterns for sedimentary soils, engineering property variables, multiple regression analyses, compatibility with land classification systems  
Descriptors: \*Engineering geology; \*Soils; \*Laterites; \*Statistical methods; \*Engineering properties; \*Properties; \*Laterite; \*statistical analysis; \*Methods; \*Statistical; \*Regression analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

574535 70-26969  
Performances of tunnel boring machines  
Proctor, Richard J.  
Assoc. Eng. Geol., Bull., Vol. 6, No. 2, p. 105-117, illus., 1969  
CODEN: ENGE49  
Subfile B  
Doc Type: SERIAL  
Languages: English  
Summary of current capabilities, with examples  
Descriptors: \*Engineering geology; \*Tunnels; \*Boring; \*Present capability; \*Statistics  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

558078 70 10446  
Stability index for underground structures in granitic rock  
Ige, John R.  
in Nevada Test Site (E. B. Eckel, ed.),  
Geol. Soc. Amer. Mem. No. 110, p. 185-197, illus. (incl. geol. sketch map), 1968  
Subfile B  
Doc Type: SERIAL  
Languages: English  
Statistical analysis, core logging technique  
Descriptors: \*Engineering geology; \*Nevada; \*Statistical methods; \*Rock mechanics; \*Granite; \*Stability index;  
Nevada Test Site; Regression analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

555925 70-08356  
Zakonomenosti izmenchivosti inzhenerno-geologicheskikh svyazey alluvial'nykh i lessovykh porod v svyazi s vydeniyem regional'nykh inzhenerno-geologicheskikh elementov  
Variability patterns in the engineering properties of alluvial and loess rocks with reference to the distinction of regional engineering-geologic units  
Sulakhina, G. A.; Rozhnovskaya, L. A.  
Vyssh. Ucheb. Zaved., Izv., Geol. Razved., No. 11, p. 106-111, illus., 1968  
Subfile B  
Doc Type: SERIAL  
Languages: Russian  
Statistical analysis, example of Tom-Yaya interfluv., southwest Siberia  
Descriptors: \*Engineering geology; \*USSR; \*Statistical methods; \*Rock mechanics; \*Tom-Yaya interfluv.; \*Variability patterns; \*Sedimentary rocks  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

STABILITY ANALYSES; \*SOILS; \*STABILITY ANALYSES

545930 70-05308-N  
 SOME STATISTICAL FEATURES OF THE RELATIONSHIP BETWEEN ROCKY MOUNTAIN ARSENAL WASTE DISPOSAL AND FREQUENCY OF EARTHQUAKES, IN ENGINEERING SEISMOLOGY - THE WORKS OF MAN  
 BARDWELL, GEORGE E.  
 GEOL. SOC. AMERICA ENG. GEOLOGY CASE HISTORIES, NO. 8, P. 33 37, 1970  
 Subfile: N  
 Descriptors: \*COLORADO; \*DENVER AREA; \*EARTHQUAKE FREQUENCY VS FLUID INJEC; \*EARTHQUAKES; \*ENGINEERING GEOLOGY; \*FLUID INJECTION; \*REGRESSION-CORRELATION ANALYSIS; \*RELATION; \*ROCKY MOUNTAIN ARSENAL; \*ROCKY MTN. ARSENAL; \*STATISTICAL ANALYSIS; \*STATISTICAL METHODS; \*WASTE DISPOSAL

544646 70-03940-N

SAFETY FACTORS AND THE PROBABILITY DISTRIBUTION OF SOIL STRENGTH (WITH FRENCH ABS.)  
 LUMI, PETER  
 CANADIAN GEOTECH. JOUR., V. 7, NO. 3, P. 225-242, 1970  
 Subfile: N  
 Descriptors: \*ENGINEERING GEOLOGY; \*ENGINEERING PROPERTIES; \*PROBABILITY DISTRIBUTION; \*SLOPE STABILITY; \*SOIL STRENGTH; \*SOILS; \*STRENGTH

543202 70-02220-N

STATISTICAL PROPERTIES OF BED FORMS IN ALLUVIAL CHANNELS IN RELATION TO FLOW RESISTANCE (ABS.)  
 ANNAMBIHOTLA, VENKATA SUDRAMANYA S.  
 DISSERT. ABS. INTERNAT., SEC. B, SCI. AND ENG., V. 30, NO. 9, P. 4147B, 1970  
 Subfile: N  
 Descriptors: \*BED FORMS; \*CHANNELS; \*ENGINEERING GEOLOGY; \*LABORATORY STUDY; \*MISSOURI RIVER; \*NEBRASKA; \*RIVERS; \*STATISTICAL PROPERTIES

552148 70-04577  
 A statistical theory of brittle fracture for rock materials; part II. Brittle failure under homogeneous triaxial states of stress  
 BRADY, B. T.  
 Int. J. Rock Mech. Mining Sci., Vol. 6, No. 3, p. 285-300, illus., 1969  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Deformation; \*Statistical methods; \*Rock mechanics; Theoretical studies  
 ; Brittle failure; triaxial loading; theory; brittle fracture  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

552144 70-04573

A statistical theory of brittle fracture for rock materials; part I. Brittle failure under homogeneous axisymmetric states of stress  
 BRADY, B. T.  
 Int. J. Rock Mech. Mining Sci., Vol. 6, No. 1, p. 21-42, illus., 1969  
 Subfile: B  
 Doc Type: SERIAL  
 Languages: English  
 Descriptors: \*Engineering geology; \*Deformation; \*Statistical methods; \*Rock mechanics; Theoretical studies  
 ; Brittle failure; axisymmetric stress; theory; brittle fracture  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

547387 70 07138-N

SEISMIC GEOLOGY OF THE EASTERN UNITED STATES  
 FOX, FRED L.  
 ASSOC. ENG. GEOLOGISTS BULL., V. 7, NOS. 1-2, P. 21-43, 1970  
 Subfile: N  
 Descriptors: \*EARTHQUAKE-RESISTANT DESIGN; \*EARTHQUAKE RESISTANT DESIGN; \*EARTHQUAKES; \*EASTERN; \*ENGINEERING GEOLOGY; \*PROBABILITY; \*UNITED STATES

547112 70-06738-N

SAFETY FACTORS IN SOIL MECHANICS (WITH FRENCH ABS.)  
 MEYERHOF, G. G.  
 CANADIAN GEOTECH. JOUR., V. 7, NO. 4, P. 349-355, 1970  
 Subfile: N  
 Descriptors: \*ENGINEERING GEOLOGY; \*ENGINEERING PROPERTIES; \*FOUNDATIONS; \*PROBABILITY CONCEPTS; \*SAFETY FACTORS; \*SOIL

533920 70-09432-G

A STATISTICAL STUDY OF RELATIONSHIPS BETWEEN ROCK PROPERTIES, CHAP. B IN STATUS OF PRACTICAL ROCK MECHANICS-SYMPOSIUM ON ROCK MECHANICS, 9TH, GILLEN, COLO., 1967, PROC.

MUTMANSKY, JAN M.; SINGH, MADAN M. NEW YORK, AM. INST. MINING, METALL., AND PETROLEUM ENGINEERS, P. 161-177 1968

Subfile: G  
 Descriptors: \*CORRELATION; \*DEFORMATION; \*EXPERIMENTAL STUDIES; \*FACTOR ANALYSIS; \*ROCK MECHANICS; \*ROCK PROPERTIES; \*STATISTICAL METHODS

517689 69-20985

Beitrage zur statistischen Mechanik der Locker- und Festgesteine  
 Statistical mechanics of unconsolidated and consolidated rocks

Neuber, Hans.

In Beitrage zur Ingenieurgeologie; ein Symposium. Fortschr. Geol. Rheinland Westfalen Vol. 15 p. 181-244 (Incl. Engl., Fr. sum.). illus., 1968

Subfile: B  
 Doc Type: SERIAL  
 Languages: German  
 Soil and rock mechanics, vectors, rheologic principles, loading tests, geometry of packing, state of stress, fissure effects  
 Descriptors: \*Engineering geology; \*Statistical methods; Rock mechanics  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

507225 69-10519

O vozmozhnosti ispol'zovaniya teorii veroyatnostey dlya resheniya nekotorykh zadach inzhenernoy geologii  
 Use of probability theory for the solution of some problems in engineering geology

Kolomeriskiy, Ye. N. Mosk. Univ., Vestn., Ser. 4, Geol. Vol. 23, No. 2, p. 85-90, illus., 1968

Subfile: B  
 Doc Type: SERIAL  
 Languages: Russian  
 Physical and mechanical properties of rocks, models  
 Descriptors: \*Engineering geology; \*Rock mechanics; Methods: probability theory  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

505716 69-09024

Priblizhno-statisticheskiy metod opredeleniya optimal'nogo kolichestva inzhenerno-geologicheskikh prob porod  
 Method of statistical approximation for determining the optimum size of engineering-geologic rock samples

Ivanova, I. N. Vyssh. Ucheb. Zaved., Izv., Geol. Razved. No. 4, p. 72-78, illus., 1967

Subfile: B  
 Doc Type: SERIAL  
 Languages: Russian  
 Descriptors: \*Engineering geology; \*statistical methods; Methods: Optimum rock sample size  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

503710 69-07032

Primeneniye posledovatel'nogo analiza pri inzhenerno-geologicheskoy oprobovanii  
 Application of sequential analysis in engineering-geologic sampling

Bondarik, G. K.; Goral'chuk, M. I. Geol. Geofiz. (Akad. Nauk SSSR, Sib. Otd.) No. 6, p. 74-80 (With Engl. sum.). illus., 1967

Subfile: B  
 Doc Type: SERIAL  
 Languages: Russian  
 Mathematical method  
 Descriptors: \*Engineering geology; \*Statistical methods; Methods: Sequential analysis of samples  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

501353 69-04686

Effective and true strength in normally-consolidated clays: some statistical considerations

Alpan, I. Int. Soc. Soil Mech. Found. Eng., Asian Reg. Conf., 3rd, Haifa, 1967, Proc., Vol. 1, p. 263-265, illus., 1957

Subfile: B  
 Languages: English  
 Effective-true failure conditions, cohesion factor, pore-water pressure  
 Descriptors: \*Engineering geology; Clays; Failure; Statistical analysis  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

490425 68-11163-N

**A statistical study of relationships between rock properties, Chap. 8**  
Miknansky, Jan M.; Singh, Madan M

**in Status of practical rock mechanics -- Symposium on Rock Mechanics, 9th, Golden, Colo., 1987, Proc.**  
New York, Am. Inst. Mining, Metall., and Petroleum Engineers  
p. 161-177, illus., tables, 1968  
Subfile: N

Descriptors: \*Deformation; \*Statistical methods;  
\*Engineering geology; Experimental studies; Rock mechanics;  
; factor analysis; correlation of properties; rock  
properties; interrelations

485885 68-08884-N

**An integrated system for exploiting quantitative terrain data for engineering purposes**  
Grabau, Warren E.

**in Land evaluation (G. A. Stewart, editor)--CSIRO-UNESCO Symposium 1988, Papers**  
South Melbourne, Vic., Australia, Macmillan Co of Australia  
p. 211-220, illus., 1968  
Subfile: N

Descriptors: \*Engineering geology; \*Statistical methods;  
Terrain analysis; Mathematical models of relations

485879 68-08881-N

**Terrain evaluation as a function of user requirements**  
Reyn, Bob D.; Grabau, Warren E.

**in Land evaluation (G. A. Stewart, editor)--CSIRO-UNESCO Symposium 1988, Papers**  
South Melbourne, Vic., Australia, Macmillan Co. of Australia  
p. 64-76, illus., table, 1968  
Subfile: N

Descriptors: \*Engineering geology; \*Military geology;  
\*Statistical methods; Terrain analysis; Terrain evaluation  
; Function of user requirements; Military and engineering  
geology

483416 68-07764-N

**The magnetite distribution in the Smallwood mine**  
Zodrow, Edwin L.  
Canadian Mining and Metall. Bull. v. 61, no. 673, p.  
629-632, illus., 1968  
Subfile: N

A knowledge of the structural geology of this deposit in the southern extension of the Labrador syncline is essential for a statistical analysis of the magnetite distribution. The orebody is a doubly plunging, inverted syncline with two periods of folding in evidence; geologic mapping has indicated a strong trending of the mineralization which violates the statistical requirement of random data. As a first step, an effort was made to obtain a first approximation of the sample density function. Two distinctly different functions for the magnetite are postulated, each being a function of the genetic mode (sedimentary and metamorphic) and subsequent geologic influence.

Descriptors: \*Engineering geology; \*Nevada; \*Iron; \*Labrador  
; \*Statistical methods; \*Land subsidence; \*Economic geology  
; Las Vegas Valley; Smallwood mine; magnetite distribution;  
statistical analysis; distribution; factor analysis

483368 68-07748-N

**Hydrogeology of the jointed dolomites, Grand Rapids hydroelectric power station, Manitoba, Canada**  
Grice, R. H.

Geol. Soc. America Eng. Geology Case Histories no. 6, p.  
33-48, illus., tables, 1968  
Subfile: N

The reservoir area is underlain by Ordovician and Silurian dolomites with a scattered cover of tills and glaciolacustrine silts. There are many sink holes in the dolomite. The distribution of joints and joint fillings in the different lithological units were mapped and statistically analyzed, and a quantitative ground-water flow technique was devised using the natural vertical water velocity profiles in uncased NX-sized drill holes. A grout curtain was devised from the exploration and research data. Since completion, continuous observations have demonstrated the evolution of the induced ground-water regimen, confirmed the effectiveness of the control measures (grout curtain and pressure relief holes), and provided data for the development and further testing of the analytical procedures for ground-water flow analysis.

Descriptors: \*Atlantic Ocean; \*Engineering geology;  
\*Manitoba; \*Marine geology; \*Geomorphology; Applications;  
Hydrogeology; Bottom features; Bahama canyon system;  
Hydrogeologic studies; Grand Rapids hydroelectric plant;  
Hydroelectric plant; Grand Rapids; ground-water control;  
ground-water flow analysis; morphology

481552 68-05812-N

**Stability index for underground structures in granitic rock**  
Ege, John R.

**in Nevada Test Site**  
Geol. Soc. America Mem. 110 p. 185-197. illus., table.  
1968  
Subfile: N

More than 2,400 feet of core drilled for an underground installation in the Climax stock, at the north end of Yucca Flat, was logged to relate degree of weathering, relative hardness, core loss and broken core to joint frequency. By statistical regression analysis correlation was significant until joints exceeded 8 per ft and lost and broken core became greater than 30 percent. Parameter values were assigned to 10 grades of joint frequency, which were related to laboratory-determined physical and mechanical properties of core samples previously determined by logging. Rock grades correlated significantly with dry bulk density, total porosity, and Young's shear, and bulk modulus, but not Poisson's ratio. Underground mapping confirmed that rock grades 8 to 10 presented no construction or stability problems. 5 to 7 tended to have moderate overbreak, 3 and 4 were unstable, and phi (faults) to 2 incompetent.

Descriptors: \*Engineering geology; \*igneous rock; \*Nevada; \*Statistical methods; \*Underground excavation; \*Granitic; \*Granitic rock; \*Stability index; Nevada Test Site; \*Engineering properties; Yucca Flat; Materials; properties; Regression analysis

480406 68-06143-N

**Geophysical activity in 1967 applied to engineering, construction, and ground water projects**

Melickian, G. E.  
Geophysics v. 33, no. 5, p. 911-914, tables. 1968  
Subfile: N

Data compiled from questionnaires sent out by the SEG Geophysical Activity Committee show that the total level of world activity in engineering, construction, and ground-water geophysics remained about the same in 1967, while the average costs decreased. It is felt that less than 50 percent of the total activity is being reported.

Descriptors: \*Engineering geology; \*Geophysical surveys; \*Practice; Worldwide; \*Geophysical activity; 1967; World; Statistics; 1967 activity; engineering; construction; ground water; statistics

478536 68-05134-N

**Maximum response ranges of nonlinear multi-story structures subjected to earthquakes**  
Giberson, Melbourne F.

Seismol Soc. America Bull. v. 58, no. 5, p. 1639-1655, illus., tables. 1968  
Subfile: N

The earthquake responses of a twenty-story nonlinear structural frame were calculated. The structure was modeled by a two-dimensional frame with girders and columns having bilinear binding moment-end rotation hysteretic characteristics. In addition to hysteretic damping, viscous damping mechanisms were assumed. Earthquakes used were the El Centro (N-S) of May 18, 1940 and several pseudo-earthquakes. Certain behavior characteristics of the structural responses were identified which appeared to be determined more by the properties of the structure than by the earthquake. For the series of pseudo-earthquakes used, a large range was found in the maximum values of the responses of the yielding structure. Statistics of the magnitudes of the displacements and ductility factors were compared with three common measurements of the strength of earthquake accelerograms; none of these measurements correlated well with the trend of maximum responses.

Descriptors: \*Engineering geology; Earthquakes; Multi-story structures; maximum response

477560 68-04579-N

**Graphical statistics and common-sense applications**

Mavis, Frederic T.  
Am. Soc. Civil Engineers Proc. v. 94, paper G108. Jour. Hydraulics Div., no. HY5, p. 1207-1216, illus., table. 1968  
Subfile: N

Analogies in statistics and mechanics can give the engineer a commonsense meaning of arithmetic means, standard deviations, and lines of mutual regression by least squares. Even so, numbers often have less vivid impact than graphs in the interpretation and projection of data which vary. Examples show how data can be analyzed graphically using medians and quartile deviations as measures of averages and variations. Such graphical methods lead to inferences equally valid and usually more meaningful than corresponding numbers arrived at by the method of least squares. A scale of probable deviations is presented in terms of percentage frequency and quartile deviations which, for normal distributions, leads graphically to the same probability estimates as those derived numerically by least squares, less abstractly and in less time. A list of papers on probability and statistics from 1901 through 1950 is appended.

Descriptors: \*Engineering geology; \*Statistical methods; Techniques; Data analysis; Graphical statistics; General; Graphic analysis

472510 68-01854-N

**Moisture characteristics of Pennsylvania soils--[pt. 1].  
Moisture retention as related to texture**

Petersen, G. W.; Cunningham, R. L.; Matelski, R. P. 271-275. Soil Sci. Soc. America Proc. v. 32, no. 2, p. 271-275. illus., tables. 1968

Subfile: N  
Average moisture contents at 1/3 and 15 atm levels and available moisture for various soil textural classes in Pennsylvania were determined from 1,267 surface and subsol samples. Multiple regression analyses showed core bulk density most strongly associated with 1/3 atm moisture. 1 mm sieved clay content with 15 atm moisture; and organic carbon also with 15 but not with 1/3 atm moisture. Available moisture correlated negatively with sand and clay, positively with silt content; it was also highly correlated with 1/3 atm moisture whereas 15 atm moisture showed either negative or no correlation. Scatter diagrams show predictability from clay percentages. Equations for estimating available moisture from predetermined soil properties are given for each USDA textural class, except sand and sandy clay, and for each textural class of the new family grouping.

Descriptors: Pennsylvania; Soils; Permeability; Statistical methods; Engineering geology; Textural classes; Moisture retention; Moisture retention; Relation to texture; Regression analysis

472477 68-01837-N

**Large-scale testing of rockfill materials--Closure  
to discussion of paper 5128, 1967**

Marsal, Raul J. Am. Soc. Civil Engineers Proc. v. 94, paper 1016, Jour. Soil Mechanics and Found. Div., no. SM 4, p. 1042-1047. illus., table. 1968

Subfile: N  
Comments of Brauns and Leussink [ibid., v. 93, no. SM 6, 1967] on danger of failure in individual grains are pertinent. After the paper [ibid., v. 93, no. SM 2, 1967] was presented, tests and theoretical analyses showed that the working hypothesis is not correct, but does take into account the main factors affecting grain breakage. Marsal believes that random phenomena are best treated by statistical methods. Observations by Hillis and Skermer [ibid., v. 94, no. SM 1, 1968] on the influence of the sand-filled membrane on test results are well justified. To clarify this effect duplicated tests were run, one with the cover described in the paper, the other with rubber membranes. Results indicate that Hillis and Skermer are correct. Due to errors in the signs of strains, the volumetric changes from circumferential extensometers in the paper are wrong; corrected values are plotted. Descriptors: Engineering geology; Mexico; Materials; Properties; Rockfill; Laboratory tests

471118 68-01137-N

**Probabilistic models for seismic force design**

Benjamin, Jack R. Am. Soc. Civil Engineers Proc. v. 94, paper 5950, Jour. Structural Div., no. ST5, p. 1175-1196, illus., tables. 1968

Subfile: N  
The procedure consists of first forecasting the probabilities of occurrence and number of quakes of a given Modified Mercalli intensity at a site from the historical record. The Poisson probability law is the most used model in earthquake forecasting, but the Bayesian statistical theory is more useful where mean rate of occurrence for events of main concern is not known. Forecasts are made for a 10-yr period for the San Francisco area, Calif. Three alternate designs for a structure are compared on the basis of expected losses, and the technique of estimating these losses for earthquakes of each intensity level is illustrated. Time-to-occurrence problems are discussed. More complex models, including the problems of occurrence, are introduced.

Descriptors: Earthquakes; Engineering geology; Prediction; Probabilistic models for seismic force design; Occurrence; Forecasting; Probabilistic models

470465 68-00807

Some problems in selecting a ground-surface length for slope-angle measurement

Pitty, A. F.

Rev. Geomorphol. Dyn. Vol. 17, No. 2, p. 66-71 (incl. Fr. sum.), illus., 1967

Subfile: E

Doc Type: SERIAL

Languages: English

The purpose of the discussion is to review an approach to slope-angle measurement which has developed largely from exploratory investigations by R.A.G. Savigear. In using this approach the slope surveyor has to delimit lengths of ground surface at points where he considers that a break in slope occurs. The ground-surface lengths are therefore of unequal extent, imposing restrictions on the application of statistical analysis to the measurements. Further limitations, introduced by the subjective assessment of where breaks in slope occur, are also illustrated. In view of these difficulties it is suggested that procedures for measuring slope-angles along a short unit-length of ground surface might prove to be a useful refinement of the techniques used by R.A.G. Savigear and others.

Descriptors: \*Engineering geology; \*Geodesy; Methods;

Slope-angle measurement

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

469769 68-00443

Formänderungen von Boden unter Belastung

Form changes of soil and sediment under load

Neuber, H.

Deut. Geol. Ges., Z. Vol. 114 (1962), No. 2, p. 318-326,

illus., 1963

Subfile: E

Doc Type: SERIAL

Languages: German

The mechanical characteristics of unconsolidated sediments, particularly those properties permitting extensive deformation and shearing, are of importance in construction. The behavior of a specific unconsolidated rock is controlled by: grain size, grain shape, mineral content, pore volume, water content, cementing media, and structure. Even if these parameters are known, the mechanical conditions can still not be predicted. Triaxial tests should therefore be made and the data statistically treated.

Descriptors: \*Engineering geology; \*Sediments; (Engineering

properties); Mechanics; deformation

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

469643 68-00376-N

The relationship of geophysical measurements to engineering

and construction parameters in the Straight Creek Tunnel pilot bore, Colorado

Scott, J. H.; Lee, F. T.; Carroll, R. D.; Robinson, C. S. Internat. Jour. Rock Mechanics and Mining Sci., v. 5, no. 1, p. 1-30, illus., table, 1968

Subfile: N

Seismic-refraction and electrical-resistivity measurements along the walls of the Straight Creek Tunnel pilot bore indicate both a low-velocity and high-resistivity layer in the disturbed rock around the excavation. The electrical resistivity and seismic velocity of rock at depth, thickness of rock in the low-velocity layer, and relative amplitude of seismic energy were correlated against parameters of importance in tunnel construction (height of tension arch, stable vertical load, rock quality, etc.). Results were found to be statistically meaningful, and suggest the possibility of predicting parameters of interest from geophysical measurements in feeler holes drilled ahead of the working face.

Descriptors: \*Colorado; \*Engineering geology; \*Electrical

surveys; \*Seismic surveys; Tunnels; Geophysical surveys;

Straight Creek; Pilot bore; Construction parameters;

Straight Creek Tunnel pilot bore; seismic; electrical;

Straight Creek Tunnel; Straight Creek pilot bore

468566 69-12694-N

SIMULTANEOUS DETERMINATION OF BASIC GEOMETRICAL CHARACTERISTICS OF POROUS MEDIA

PEREZ-ROSALES, CANDELARIO.

SOC. PETROLEUM ENGINEERS JOUR., V. 9, NO. 4, P. 413-416,

1969; SOC. PETROLEUM ENGINEERS TRANS. 1969, V. 246 1970

Subfile: N

Descriptors: \*ENGINEERING GEOLOGY; \*GEOMETRIC CHARACTERISTI-

CS; \*MATERIALS; \*PROPERTIES; \*POROUS MEDIA; \*SIMULTANEOUS

DETERMINATION; \*STATISTICAL METHODS; \*VARIANCE ANALYSIS

- 466603 69-10541-N  
**STRAIN DISTRIBUTION AROUND UNDERGROUND OPENINGS - TECH. REPT. 2. STATISTICAL METHODS TO COMPARE AND CORRELATE ROCK PROPERTIES AND PRELIMINARY RESULTS (ADVANCED RESEARCH PROJECTS AGENCY CONTRACT DACA 73-88-C-0002(PO02))**  
 JUDD, WILLIAM R.  
 WASHINGTON, D. C., OFFICE OF CHIEF OF ENGINEERS, DEPT. ARMY, 109 P. 1969  
 Subfile: N  
 Descriptors: \*AUTOMATIC DATA PROCESSING; \*COMPUTER ANALYSIS; \*COMPUTER; \*DATA COMPILATION; \*ENGINEERING GEOLOGY; \*ROCK MECHANICS; \*UNDERGROUND OPENINGS
- 463787 69-06641-N  
**INVESTIGATIONS INTO THE PROBABILITY OF SURFACE FAULTING (ABS.), IN ENGINEERING GEOLOGY AND SOILS ENGINEERING SYMPOSIUM, 7TH ANN., MOSCOW, IDAHO, 1969, PROC.**  
 SMITH, JAY L.  
 BOISE, IDAHO, IDAHO DEPT. HIGHWAYS, P. 222 1969  
 Subfile: N  
 Descriptors: \*CALIFORNIA; \*ENGINEERING GEOLOGY; \*FOUNDATIONS; \*PROBABILITY; \*SITE SELECTION; \*SOUTHERN; \*STRUCTURAL GEOLOGY; \*SURFACE FAULTING PROBABILITY; \*SURFACE FAULTING
- 462239 69-04704-N  
**A MATHEMATICAL MODEL FOR PIT SLOPE STABILITY, IN OPERATIONS RESEARCH AND COMPUTER APPLICATIONS IN THE MINERAL INDUSTRIES**  
 HAMMEL, D. J.  
 COLORADO SCHOOL MINES QUART., V. 64, NO. 3, P. 53-69 1969  
 Subfile: N  
 Descriptors: \*ENGINEERING GEOLOGY; \*MATHEMATICAL ANALYSIS; \*MODEL STUDY; \*SLOPE STABILITY; \*STATISTICAL METHODS; \*VARIANCE ANALYSIS
- 461030 69-03347-N  
**A STATISTICAL THEORY OF BRITTLE FRACTURE FOR ROCK MATERIALS-PT. 2. BRITTLE FAILURE UNDER HOMOGENEOUS TRIAXIAL STATES OF STRESS**  
 BRADY, B. T.  
 INTERNAT. JOUR. ROCK MECHANICS AND MINING SCI., V. 6, NO. 3, P. 285-300 1969  
 Subfile: N  
 Descriptors: \*BRITTLE ROCK FRACTURE; \*BRITTLE ROCK; \*DEFORMATION; \*ENGINEERING GEOLOGY; \*EXPERIMENTAL STUDIES; \*FACTOR ANALYSIS; \*FAILURE; \*FRACTURE STRENGTH; \*HOMOGENEOUS TRIAXIAL STRESS; \*MATERIALS; \*PROPERTIES; \*ROCK MECHANICS; \*STATISTICAL METHODS; \*TRIAXIAL LOADING
- 459683 69-00968-N  
**A STATISTICAL THEORY OF BRITTLE FRACTURE FOR ROCK MATERIALS-PT. 1. BRITTLE FAILURE UNDER HOMOGENEOUS AXISYMMETRIC STATES OF STRESS**  
 BRADY, B. T.  
 INTERNAT. JOUR. ROCK MECHANICS AND MINING SCI., V. 6, NO. 1, P. 21-42 1969  
 Subfile: N  
 Descriptors: \*BRITTLE FAILURE; \*BRITTLE; \*DEFORMATION; \*ENGINEERING GEOLOGY; \*EXPERIMENTAL STUDIES; \*EXPERIMENTAL STUDY; \*FRACTURE; \*ROCK MECHANICS
- 459113 67-11525  
**Quick-clay microstructure (Recent quick-clay studies, 3)**  
 Pusch, Roland  
 Eng. Geol. Vol. 1, No. 6, P. 433-443, illus., 1966  
 Subfile: E  
 Doc Type: SERIAL  
 Languages: English  
 Comparison of samples of late Pleistocene marine clays of the Gota river valley, Sweden, whose salt content was leached subsequent to deposition (quick clays) and unleached clays from the same horizon showed no significant microstructural differences. Statistical analysis of size and shape variations of the micropores revealed in electron micrographs are discussed in relation to permeability and strength properties of the quick clay, with particular reference to the development of deformation properties.  
 Descriptors: \*Sweden; \*Engineering geology; \*Sediments; \*Clays; \*Clay; \*Gota Valley; \*Microstructure; \*Structures  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)
- 456067 67-09173-N  
**The variability of natural soils**  
 Lumb, Peter  
 Canadian Geotech. Jour. V. 3, no. 2, P. 74-97, illus., tables, 1966  
 Subfile: N  
 with French abs.  
 Descriptors: \*Engineering geology; \*Soils; \*Statistical methods; \*Engineering properties; \*Properties; \*variability; \*statistical analysis; \*Variance analysis

456381 67-08994-N

Analytical techniques for determining ground water flow fields--Hydraulic Lab. Tech. Rept. 8-28  
Shahbezi, Mohsen; Todd, David K.  
California Water Resources Center Contr. 117 139 p.  
illus., tables. 1967  
Subfile: N

Descriptors: \*Automatic data processing; \*Hydrogeology;  
\*Statistical methods; Engineering geology; Aquifer  
properties; Ground-water movement; Mathematical models;  
Ground-water flow fields; Factor analysis; Analytical  
techniques; mathematical model

456375 67-08991-N

Theoretical analysis of groundwater basin operations--Hydra-  
ulic Lab. Tech. Rept. 8-25  
McClintan, William D.  
California Univ. Water Resources Center Contr. 114 167 p.  
illus., tables. 1966  
Subfile: N

Descriptors: \*Automatic data processing; \*Hydrogeology;  
California; \*Statistical methods; Engineering geology;  
Ground-water movement; Mathematical models; System analogs;  
Ground-water basin operations; conductivity variations;  
Ground-water basins; theoretical analysis; models; basin  
variation models; Variance analysis

446381 67-03802

Engineering geology of the Dez project, southwest Iran  
Dodds, R. Kenneth.  
Eng. Geol. (Ass Eng. Geol.) Vol. 3, No. 1-2, p. 21-32,  
1966  
Subfile: E

Doc Type: SERIAL  
Languages: English  
This project is built entirely in a Pliocene cobble  
conglomerate in which continuous structural features are  
confined to widely spaced joints. The physical properties of  
the conglomerate were studied. These data were combined with  
detailed geologic maps for statistical evaluation of in situ  
bearing capacity.

Descriptors: \*Iran; \*Engineering geology; Rock mechanics  
; Dez project  
; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

446249 67-03735

Some numerical results concerning the shear strength of  
London clay

Hooper, J. A.; Butler, F. G.  
Geotechnique Vol. 16, No. 4, p. 282-304, illus., 1966  
Subfile: E

Doc Type: SERIAL  
Languages: English  
Numerical data pertaining to the shear strength of London  
clay is given. Results are given of triaxial and constant rate  
of penetration tests carried out at a number of sites. At one  
particular site, a large number of undrained triaxial tests  
were performed, enabling results to be analysed on a  
statistical basis. It is shown that the variation in  
laboratory shear strength at specific levels in the clay  
stratum is closely related to the well-known Gaussian  
distribution. In addition, samples taken hydraulically give  
strengths which are more consistent and about 20 percent  
higher than corresponding driven samples obtained from  
moderate depths. Calculations show that the standard deviation  
and coefficient of variation for driven samples are  
approximately double those relevant to hydraulic samples. For  
a given sampling method, the coefficient of variation appears  
to be reasonably constant over a considerable depth range.  
Results of constant rate of penetration tests indicate that  
this method gives strengths which are more consistent and  
perhaps more representative of in-situ conditions than those  
produced from normal sampling techniques.

Descriptors: \*Engineering geology; Clays; Shear strength  
; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

444804 67-02965-N

The use of statistical analysis in quarry evaluation  
West, Terry R.; Smith, Ned M.; Johnson, Robert S.

In A symposium on industrial mineral exploration and  
development--Forum on Geology of Industrial Minerals. 3d,  
Univ. Kansas, 1967, Proc.  
Kansas Geol. Survey Spec. Distrib. Pub. 34 p. 10-25,  
illus., tables. 1967  
Subfile: N

Descriptors: \*Construction materials; \*Indiana; \*Limestone;  
\*Statistical methods; Economic geology; Engineering geology;  
; Properties; Mississippian limestones; evaluation;  
Mississippian; Variance analysis; Limestone properties

443606 67-02349

**A theoretical investigation on the formation factor-permeability-porosity relationship using a network model**

Schopper, Jurgen R.  
Geophys. Prospect. (The Hague) Vol. 14, No. 3, p. 301-341, illus., 1966

Subfile: E

Doc Type: SERIAL

Language: English

The knowledge of hydraulic and electric properties of porous media and the relations between them is essential for the quantitative evaluation of electric well logs and the solution of other reservoir engineering problems. A general theory of the electric and hydraulic resistance behavior of porous media on the basis of a very general statistical network model is developed. A general solution of the relations between formation factor, permeability, and porosity is presented by means of a rigorous mathematical treatment of two limiting cases of such a network. The product of the formation factor and the permeability can be expressed in the expectation values and the variation coefficients of pore channel cross section and shape factor and by a network factor that depends on the mesh texture of the network. This network factor is in the range zero to one. The path length increment enters both the electric and the hydraulic tortuosity by its square.

Descriptors: \*Electrical properties; \*hydrogeology; \*well-logging; \*Engineering geology; \*Petroleum; \*porous media; \*hydrodynamics; \*Electrical; \*Reservoirs; \*Hydraulic properties relationship; \*significance in resistivity measurements; \*Electrical properties relationship; Interpretation; \*formation factor-permeability-porosity relations; \*Electrical well log evaluation

Section Headings: 23 (SURFICIAL GEOLOGY, GEOMORPHOLOGY)

440483 67-01098-1

**A statistical forecasting of engineering properties and compression index of soils, Salt Lake City, Utah**

Cardone, Anthony Thomas

1966

Subfile: T

Degree Level: Master's

Doc Type: THESIS

Descriptors: \*Soils; \*Utah; \*Engineering geology; \*Engineering properties; \*Salt Lake City

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

429926 67-10493-G

**SOME IMPLICATIONS OF STATISTICAL TRANSPORT THEORY IN ROCK MECHANICS**

SCHIEDEGGER, MIRIAM EUGEN.

PURE AND APPL. GEOPHYSICS, V. 65, P. 160-163 1966

Subfile: G

Descriptors: \*DEFORMATION; \*ROCK MECHANICS; \*SUBSIDENCE; \*THEORETICAL STUDIES

426027 66-12120-G

**THE PROBABILISTIC NATURE OF FAILURE IN THE GEOLOGIC UNIVERSE, IN INTERNAT. CONF. STRATA CONTROL AND ROCK MECHANICS, 4TH, NEW YORK, 1964, PROC.**

WANE, MALCOLM T.; HASSIALIS, MENELAS D.; RDSHKOV, STEFAN. NEW YORK, COLUMBIA UNIV. PRESS, P. 324-329, 1964 (1965)

Subfile: G

Descriptors: \*FAILURE; \*PROBABILITY; \*ROCK MECHANICS; \*STATISTICAL CONCEPTS; \*STRENGTH

419521 66-11335-N

**A three dimensional optimum pit program and a basis for a mining engineering system**

Hartman, R. J.; Varma, G. C.

In Internat. Symposium on Computers and Operations Research, 6th Ann., 1966

Pennsylvania State Univ. Mineral Industries Expt. Sta. Spec. Pub. 2-65, V. 3 p. 001-0035, illus., 1966

Subfile: N

Descriptors: \*Statistical methods; \*Mining geology; \*Engineering geology; \*Evaluation; \*Open-pit mining; \*optimum ore valuation; \*Open pit; \*3-dimensional grid program

418182 66-07542-N  
**Seismic regionalization of eastern Canada**  
 Hamilton, Angus C.

In Symposium on design for earthquake loadings, Montreal, 1966, Proc. Montreal, Quebec, McGill Univ. p. II-1-11 23. illus., table, 1966  
 Subfile: N

Seismic regionalization is defined as a method of establishing earthquake risk factors using seismicity analyses supplemented, in some cases, by tectonic information. Definitive catalogs of all earthquakes known to have occurred in historical time in eastern Canada have been published, providing the basis for statistical evaluation of earthquake risk. Good progress has been made on compilation of a regionalization map prepared objectively by sound statistical methods. Information on recent tectonic activity in eastern Canada is summarized. Although preliminary analysis of geomorphological, tide gauge, leveling and gravity data indicates that postglacial crustal tilting has been, is, and should be occurring on a regional scale, much more data are needed before there is any possibility of using tectonic information to supplement seismicity analysis for the regionalization of eastern Canada.

Descriptors: \*Canada; \*earthquakes; \*Engineering geology; seismic regionalization; eastern; Seismicity; regionalization

416980 66-06020-N

**The effect of stress concentrations on the stability of tunnels**  
 Coates, D. F.

In Internat. Soc. Rock Mechanics Congress, 1st, Lisbon, 1966, Proc., V. 2  
 Lisbon, Portugal, Laboratorio Nacional Engenharia Civil p. 299-305, illus., tables, 1966  
 Subfile: N

With French and German abs...  
 Stress concentrations around an underground opening may theoretically exceed the strength of the rock mass. Deviations of actual rock properties from those of homogeneity and perfect elasticity can, however, modify theoretical stress distributions considerably. In addition, known variation of strength of rocks with volume of rock makes predictability of failure due to stress concentration questionable. Several experiments have been conducted which show that failure due to compressive stress concentrations can be predicted under favorable circumstances quite accurately. However, considering failure as a stochastic phenomenon, predictions could be in terms of probability of failure rather than certainty. As a result, it can be seen that a main requirement to improve correspondence between experimental and predicted results is

416833 66-05866-N

**Coastal processes. [Chap.] 9**  
 Johnson, J. W.; Eagleson, P. S.

In Estuary and coastline hydrodynamics  
 New York, McGraw-Hill Book Co. (Eng. Soc. Mons.) p. 404-492, illus., tables, 1966  
 Subfile: N

This textbook chapter reviews sources and characteristics of beach material, modes of transport and losses of material, quantitative analysis of transport processes, characteristics of beach deposits and of the equilibrium beach, and sediment problems at coastal structures. The general character and magnitude of oceanic and estuarine currents are considered in longshore and onshore-offshore sediment movement, and the principal features and uses of quantitative analyses are discussed, as well as methods of sampling and measurement of statistical distributions of beach deposits. Classification of beach profiles in the offshore zone is tabulated, and the sorting of sediments is described. Typical shoreline examples illustrate changing configuration and sediment problems with man-made structures.

Descriptors: \*Sedimentation; \*Geomorphology; \*estuaries; \*Engineering geology; \*Ocean currents; \*Shore features; Shorelines; Coastal processes; engineering problems; Beaches; processes; materials

414743 66-03513-N

Earthquake ground motion and engineering procedures for important installations near active faults  
Plume, John A

In World Conf. Earthquake Eng., 3d, New Zealand, 1965, Proc., V. 3  
Wellington, New Zealand Inst. Engineers p. IV-53-IV-71, illus., tables, 1965. 1966  
Subfile: N

Costly or sensitive buildings, structures, and facilities are being constructed in active earthquake areas throughout the world. Building codes and normal design practices are not always compatible with the inherent risks. This paper outlines procedures for site studies and site selection, evaluation of seismic probability and risk, a new approach to ground motion based upon soil and rock properties, response spectra, inelastic design criteria, and related matters, in the light of current (limited) knowledge. Hypothetical examples are based upon experience with nuclear power plants and major research facilities close to active faults. Analytical, empirical, philosophical, and practical considerations are recruited.

Descriptors: \*Engineering geology; \*Earthquake; \*Effects; \*Building sites; \*active fault areas; \*ground motion; \*engineering procedures; \*Engineering structures; \*fault areas; \*site selection

414739 66-03509-N

A simulation of earthquake amplification spectra for southern California sites  
Lacer, Donald A.

In World Conf. Earthquake Eng., 3d, New Zealand, 1965, Proc., V. 1  
Wellington, New Zealand Inst. Engineers p. III-151-III-167, illus., tables, 1965. 1966  
Subfile: N

A mathematical model is developed for estimating the maximum ground motion to be expected at a given site in a given time period. More than 2,000 simulated earthquakes are generated using Monte Carlo and other statistical techniques. A digital computer program is used to calculate the maximum velocity spectra at several southern California sites due to the simulated earthquakes. It is concluded that the simulated earthquake approach is a reasonable analytic method that can be refined to yield results which will be of importance in earthquake resistant structural design.

Descriptors: \*Statistical methods; \*Earthquakes; \*California; \*Engineering geology; \*Effects; \*Monte Carlo technique; \*ground motion; \*maximum velocity spectra; \*computer program; \*Southern; \*General; \*Ground motion simulation; \*mathematical model; \*California sites

414732 66-03501-N

Earthquake spectrum prediction for the Valley of Mexico  
Herrera, Ismael; Rosenblueth, Emilio; Rascon, O. A.

In World Conf. Earthquake Eng., 3d, New Zealand, 1965, Proc., V. 1  
Wellington, New Zealand Inst. Engineers p. I-61-I-74, illus., table, 1965. 1966  
Subfile: N

Paper reports field and laboratory tests to determine the dynamic properties of Mexico City clay. The data are used in conjunction with a linear, one-dimensional theory of multiple wave reflection in stratified media and the results are treated in accordance with an approximate theory, which permits computing the probability distributions of spectral responses for various degrees of damping. Expected spectra are compared with those obtained from earthquake records. Missing information for deep strata is found by trial and error and velocities measured for the upper layers are adjusted on reasonable bases. The comparison is deemed good.

Descriptors: \*Engineering geology; \*Earthquakes; \*Elastic properties; \*Mexico; \*Clay; \*Spectrum prediction; \*Valley of Mexico; \*General; \*response spectrum; \*Mexico City; \*spectral response; \*distribution in earthquakes

414731 66-03500-N  
**Response spectra on stratified soil**  
 Herrera, Ismael; Rosenblueth, Emilio  
 In World Conf. Earthquake Eng., 3d, New Zealand, 1965, Proc., V. 1  
 Wellington, New Zealand Inst. Engineers p. 1-44--1-60, illus., 1965, 1966  
 Subfile: N  
 Paper concerns the probability distribution of spectral responses of viscously damped single-degree system resting on a stratified viscoelastic soil. The soil is assumed to rest on a viscoelastic homogeneous half space of rock. Motion arriving at the rock-soil interface is idealized as a stationary Gaussian process. The transfer function for the soil formation is treated independently for each vibration frequency of interest. In order to allow for dependence of viscoelastic parameters on the wave frequency, this is accomplished through use of a matrix formulation. Certain additional approximate results are included.  
 Descriptors: \*Engineering geology; \*Earthquake; Effects; Structures; response spectra; stratified soil; foundation; Engineering structures

414600 66-03362-N  
**Analysis of textural and physical factors contributing to the abrasion resistance of some Indiana carbonate aggregates**  
 West, Terry R.; Johnson, Robert B.  
 Indiana Acad. Sci. Proc. 1965 v. 75, p. 153-62, illus., 1966  
 Subfile: N  
 Textural data on Indiana carbonate aggregates were obtained by hand specimen examination, and from polished- and thin-section analysis. Engineering tests were run principally on the Los Angeles abrasion machine, and a multiple regression and correlation analysis was made on the resulting data. A cluster diagram of simple correlation coefficients is given for each of the four different statistical analyses made. Significant parameters are insoluble residues, void content, degradation value, average grain diameter, and barium sulfate loss.  
 Descriptors: \*Construction materials; \*Indiana; \*Engineering geology; Materials; properties; Aggregates; carbonate; abrasion resistance; analysis; aggregate

410576 65-14004-N  
**Stochastic processes in the grain skeleton of soils**  
 Marsal, R. J.  
 In Internat. Conf. Soil Mechanics and Found. Eng., 6th, Montreal, Quebec, 1965, Proc., V. 1

Toronto, Ontario, Univ. Toronto Press p. 303-307, illus., 1965  
 Subfile: N  
 with French abs.  
 Descriptors: \*Soils; \*Statistical methods; Structure; Stochastic analysis; Stochastic analysis of grain skeleton; Soil structure

410290 65-13687-N  
**Some implications of statistical transport theory in rock mechanics [abs.]**  
 Scheidegger, Adrian E.  
 Mining Eng. v. 17, no. 12, p. 39, 1965  
 Subfile: N  
 Descriptors: \*Engineering geology; Rock mechanics; Statistical transport theory

409214 65-12410-N  
**The probabilistic nature of failure in the geologic universe**  
 Vane, Malcolm T.; Hasselais, Menelaos D.; Bankov, Stefan  
 In Internat. Conf. Strata Control and Rock Mechanics, 4th, New York, 1964, Proc.  
 New York, Columbia Univ. Press p. 324-329, illus., 1964, 1965  
 Subfile: N  
 Descriptors: \*Statistical methods; Engineering geology; Probability applied to rock strength

407995 65 05846-N

**Rock mechanics principles**

Coates, D. F. Mines and Tech. Surveys Mines Br. Mon. 874 [318] p., illus., 1965  
Subfile N

In this guide for the young engineer or scientist, emphasis is on application of engineering mechanics to problems arising from the needs either to prevent or to cause rock failure, especially in mining. Various important theories in mechanics and rock properties are reviewed for background information. The main groups of rock problems examined in separate chapters are elastic prototypes; shafts, drifts and tunnels; pillars; slopes, caving and subsidence; rock slopes; foundations; and rock dynamics. The quantitative statistical expression of the dispersion of material properties enables decisions to be made on the degree of risk to be taken, but for prediction with certainty comparative analyses still can be valuable, and experience and good judgment are invaluable.

Descriptors: Education; Engineering geology; Mining geology; Rock mechanics; Textbooks; Technology; Methods; Textbook; Mining problems; Principles; Rock mechanics principles; Mining applications

407937 65 05672-N

**Volume change**

Holtz, W. G.

**In Methods of soil analysis--pt. 1, Physical and mineralogical properties, including statistics of measurement and sampling**

Madison, Wis., Am. Soc. Agronomy (Agronomy, no. 9) p. 448-465, illus., 1965  
Subfile N

For consolidation tests on soils the apparatus needed includes a consolidometer, a loading device, and a device for cutting undisturbed specimens and for preparation of remolded specimens. Procedure is described in detail from specimen preparation to measuring rebound. Calculation instructions include data sheets and examples of data plotting and instructions on report writing are given. Expansion and shrinkage tests use the same apparatus as consolidation; procedures are described.

Descriptors: Engineering geology; Soils; Engineering principles; Consolidation; Testing methods

407931 65-05671-N

**Shear strength**

Sillberg, John R.

**In Methods of soil analysis--Pt. 1, Physical and**

**Mineralogical properties, including statistics of measurement and sampling**

Madison, Wis., Am. Soc. Agronomy (Agronomy, no. 9) p. 431-447, illus., 1965  
Subfile N

In testing for shear strength, external forces are applied to the soil specimen in such a way that two adjoining parts slide relative to each other. This measurement can be made either in place or in the laboratory. In-place measurements include vane-shear, plate-load, and penetration tests. Laboratory tests include miniature vane-shear, direct shear, and triaxial and unconfined compression. The last three are described in detail.

Descriptors: Engineering geology; Soils; Engineering properties; Shear strength; Testing methods

404936 65-00737-N

**Phenomena affecting improvement of the lower Columbia estuary and entrance**

Lockett, John B.

**In Federal Inter-Agency Sedimentation Conf., Jackson, Miss., 1963, Proc., Symposium 3--Sedimentation in estuaries, harbors, and coastal areas**

U.S. Dept. Agriculture Misc. Pub. 970 p. 626-669, illus., tables, 1965  
Subfile N

In this paper past concepts are examined of phenomena controlling the regimen of this area at the mouth of the Columbia River near Astoria, Oreg., as related to work undertaken to improve its navigability. New concepts emphasize the relation of salinity intrusion and littoral movement to degree of shoaling. Statistical wave studies, analyses of offshore changes, studies of attrition and accretion of adjacent shorelines, and comprehensive investigations of the distribution of Columbia River sediments are reviewed. Bathymetric charts of several years are presented; one is dated 1792. Considerations for the future under controlled upland discharge are outlined.

Descriptors: Estuaries; Sedimentation; Oregon; Rivers; Engineering geology; Estuarine; Columbia River mouth; Controlling phenomena; Harbor improvements; Columbia River estuary; Columbia estuary

402185 64-06593-N

**Modulus of elasticity of a rock determined by four different**

**Methods**  
Cannaday, Francis X.  
U.S. Bur. Mines Rept. Inv. 6533 59 p., illus., tables, 1964

Subfile: N  
Young's modulus of elasticity was determined for specimens cut from a single original block of Bedford, Indiana, limestone. For given environmental and stress conditions, differences between moduli obtained by (1) deformation of a borehole in a prism subjected to uniaxial stress, (2) deflection of a thin beam of uniform cross-section uniformly loaded, (3) sonic-pulse velocity measurements, and (4) strain-measurements on a prism under uniaxial stress, are smaller than physical variations within the rock tested. The paper includes tables of specific gravity measurements and a statistical analysis of experimental results.

Descriptors: \*Rock mechanics; \*Elasticity; \*Limestone; \*Young's modulus; \*determination methods; Bedford Limestone; \*experimental determination methods; Bedford

401221 64-05239-N

**The prediction of strength in the sediments of St. Andrew**

**Bay, Florida**  
Holmes, C. W.; Goodell, H. G.  
Jour. Sed. Petrology v. 34, no. 1, p. 124-143, illus., 1964

Subfile: N  
The cohesion, or strength, of marine sediments of cores from ten sites in St. Andrew Bay was studied as a function of other sediment characteristics by multiple linear regression and non-linear regression. Strength, measured by unconfined compression of vane shear tests, is found to decrease as sediment water increases, to increase with depth in core, and to increase with increase in ratio of kaolinite to illite. All these variables are linearly related to strength, but they are also associated with second-order effects which may both increase and decrease strength. Penetration depends on sediment water content, mean grain size, sorting, and void ratio.

Descriptors: \*Florida; \*Sediments; \*Wells and drill holes; \*Statistics; \*Submarine geology; \*Engineering geology; \*Saint Andrew Bay; \*marine sediment cores; \*strength; \*statistical analysis; \*marine cores; \*related variables; \*sediment cores

400877 64-04825-N

**Engineering geology of Straight Creek tunnel site, Colo.**

Robinson, C. S.; Lee, F. T.

**In Symposium on soil exploration, Atlantic City, N. J., 1963**  
Am. Soc. Testing and Materials Spec. Tech. Pub. 351 p. 17-28, illus., 1964  
Subfile: N

Straight Creek tunnel will be driven through Precambrian granite and metamorphic rocks; the latter are inclusions in the granite that range from less than a foot to an average maximum dimension of 200 feet. The rock of the area has been extensively faulted, sheared, jointed, and locally altered. Geologic information collected from surface and drill-hole exploration and correlated with geophysical and laboratory data is treated statistically and projected to tunnel level. Thus the engineering behavior of the rocks is predicted and expressed in terms of the rock load, support requirements, intervals to be tested by feeler holes, amount of grout required, ground water flow at the portal, and the maximum initial ground water flow for various intervals of the tunnel.  
Descriptors: \*Colorado; \*Wells and drill holes; \*Engineering geology; \*Structural geology; \*Straight Creek tunnel site; \*statistical model; \*pilot cores

388899 62-05555-N

**Landslides along the Columbia River valley, northeastern**

**Washington**  
Jones, Fred D.; Embody, Daniel R.; Peterson, Warren L.; Hazlewood, Robert M.  
U.S. Geol. Survey Prof. Paper 367 98 p., illus., tables, geol. maps, 1961, 1962  
Subfile: N

Descriptors: \*Engineering geology; \*Landslides; \*Washington; \*Seismic surveys; \*Statistical methods; \*Geophysical surveys; \*Maps; \*Columbia River valley; \*northeastern; \*landslide areas; \*Landslide analysis; \*seismic; \*Geologic

387623 62-04218-N

**Correlation of rock properties by statistical methods**

Judd, W. R.; Huber, Carolyn  
in **International symposium on mining research, Univ. Missouri, 1961, Proc., V. 2**  
New York, Pergamon Press p. 621-648, illus., 1962  
Subfile: N

Descriptors: \*Engineering geology; \*statistical methods; \*Mining geology; \*Rock mechanics; \*Physical properties; \*correlation; \*Rock properties

DIALOG FILE89 GENREF : 61 R2/Sep (Copr. American Geological Institute) (Item 1356 of 1356) User: 5208 2sep82

380188 61-05619-N

**Littoral materials of the south shore of Long Island, New York**

Taney, Norman E.  
U.S. Army Corps Engineers. Beach Erosion Board Tech. Memo.  
129 (48) p. illus., tables. 1961

Subfile N  
Descriptors : New York; \*Sedimentary petrology; \*Statistics  
: Engineering geology; Petrology; Littoral materials  
analysis; Long Island; south shore; protection problems;  
littoral materials

1101281 82-24625

**Probabilistic treatment of faulting in geologic media**

Donath, F. A.; Cranwell, R. M.  
Univ. Ill., Urbana, Ill., USA; Sandia Lab., USA  
**Mechanical behavior of crustal rocks; the Handin volume**  
Carter, N. L. (EDITOR); Friedman, M. (EDITOR); Logan, J. M. (EDITOR); Stearns, D. W. (EDITOR)  
Tex. A&M Univ., Cent. Tectonophys., College Station, TX, USA  
Geophysical Monograph 24, 231-241p., 1981  
CODEN: GPMGAD ISSN: 0065-8448 12 REFS.  
Subfile: B

Country of Publ.: United States  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: 1 table  
Descriptors: faults; waste disposal; geologic hazards;  
displacements; radioactive waste; active faults;  
prediction; rock mechanics; probability; stress;  
statistical analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1096239 82-18539

**Probabilistic approach to deformation and strength properties of shale mass**

Kulatilake, P. H. S. W.  
Ohio State Univ., Columbus, OH, USA  
166p., 1981  
Subfile: B  
Degree Level: Doctoral  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Availability: Univ. Microfilms  
Descriptors: rock mechanics; deformation; materials;  
properties; theoretical studies; shale; yield strength;  
Connaught Group; strength; probability; statistical analysis; geometry; Ohio; United States; Pennsylvania;  
Paleozoic; clastic rocks; materials; properties; Young's modulus; elastic constants  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1080379 82-03990

**Slope stability analysis and design based on probability techniques at Cassiar Mine**

Piteau, D. R.; Martin, D. C.  
D. P. Piteau and Assoc., West Vancouver, BC, CAN  
CIM Bulletin (1974) 70: 779, 139-150p., 1977  
ISSN: 0317-0926 5 REFS.  
Subfile: B

Country of Publ.: Canada  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus.: 2 tables, sect.  
Latitude: N591000; Longitude: W1204000; W1300000  
Descriptors: rock mechanics; British Columbia; mining geology;  
geology; materials; slope stability; open-pit mining; methods; argillite; properties; engineering geology;  
Cassiar Mine; Sylvester Group; Canada; northern British Columbia; design; failures; peridotite; ultramafic family; clastic rocks; volcanic rocks; fractures; joints; style; strength; materials; properties; berms; wedges  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1029148 81-16262

**Fracture densities in the Rattlesnake Mountain fold, Wyoming**

Goodwin, E. R. K.  
Univ. of Oklahoma, Norman, OK, USA  
unknownp., 1979  
Subfile: B  
Degree Level: Master's  
Country of Publ.: United States  
Doc Type: THESIS Bibliographic Level: MONOGRAPHIC  
Languages: English  
Latitude: N420000; Longitude: W1060000; W1070000  
Descriptors: Wyoming; structural analysis; rock mechanics; sedimentary rocks; structural geology; fractures; field studies; carbonate rocks; strain; Natrona County; Big Horn Formation; United States; dolostone; Rattlesnake Mountain; folds; probability; Basin and Range Province  
Section Headings: 16 (STRUCTURAL GEOLOGY)

1018903 81-08130

**Probability of kinematic instability in rock slopes; a numerical approach**

Glynn, E. F.; Einstein, H. H.  
 Univ. Pa., Philadelphia, PA, USA; Mass. Inst. Technol., USA  
 20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
 Symp. Rock Mech., Proc. 20, 317-325p., 1979  
 CODEN: PSRMA6 ISSN: 0586-3031 6 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.

Descriptors: \*rock mechanics; \*slope stability; theoretical studies; mathematical methods; numerical analysis; errors; joints; fractures; kinetics; kinematics; slopes  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

1018897 81-08277

**Statistics of structural responses to seismic waves filtered through rock and soil formations**

Spanos, P. T. D.  
 Univ. Tex. Austin, Austin, TX, USA  
 20th U.S. symposium on rock mechanics, Austin, TX, United States, June 4-6, 1979  
 Symp. Rock Mech., Proc. 20, 273-278p., 1979  
 CODEN: PSRMA6 ISSN: 0586-3031 11 REFS.  
 Subfile: B

Country of Publ.: United States  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus., sect.

Descriptors: \*rock mechanics; \*seismology; theoretical studies; elastic waves; mathematical models; statistical methods; earthquakes; probability; damping; frequency  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

994095 80-35645

**Probability of pillar failure at Elliot Lake**

Coates, D. F.  
 Advances in rock mechanics--Progress en mecanique des roches--Fortschritte in der Felsmechanik; Events and discussion  
 Wallace, G. B. (chairperson)  
 Third congress of the International Society of Rock

Mechanics; Advances in rock mechanics, Denver, Colo., United States, September 1-7, 1974  
 Int. Soc. Rock Mech., Congr., Proc. 3, Vol. 3, 133-143p., 1974  
 CODEN: 32ZUA4 ISSN: 0074-848X 8 REFS.  
 Subfile: B

Country of Publ.: Varies  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English Summary Languages: French  
 illus.

Descriptors: \*Ontario; \*rock mechanics; \*engineering geology; experimental studies; foundations; Canada; Elliot Lake  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

908077 78-39397

**A general probabilistic analysis for three-dimensional wedge failures**

Major, G.; Ross-Brown, D.; Kim, H.  
 Dames and Moore, Denver, Colo., USA  
 19th U.S. symposium on rock mechanics, Stateline, Nev., United States, May 1-3, 1978  
 Symp. Rock Mech., Proc. 19, Vol. 2, 45-56p., 1978  
 CODEV: PSRMA6 15 REFS.  
 Subfile: B

Country of Publ.: Varies  
 Doc Type: SERIAL: CONFERENCE PUBLICATION Bibliographic Level: ANALYTIC  
 Languages: English  
 illus.

Descriptors: \*rock mechanics; \*slope stability; failure; probability; Monte Carlo analysis; models; three-dimensional models; experimental studies; mines; wedges  
 Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

909076 78-39401

**Probabilistic analysis of the plane shear failure mode**

Marek, J. M.; Savelly, J. P.  
Pincock, Allen and Holt, Tucson, Ariz., USA  
19th U. S. symposium on rock mechanics, Stateline, Nev.,  
United States, May 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 2, 40-44p., 1978  
CODEN: PSRMA6 5 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.  
Descriptors: rock mechanics; slope stability; failure;  
shear strength; probability; Monte Carlo analysis;  
mathematical methods  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

908003 78-39338

**A probabilistic model for shearing resistance of jointed rock**

Glynn, E.; Einstein, H. H.; Veniziano, D.  
Mass. Inst. Technol., Cambridge, Mass., USA  
19th U. S. symposium on rock mechanics, Stateline, Nev.,  
United States, May 1-3, 1978  
Symp. Rock Mech., Proc. 19, Vol. 1, 66-76p., 1978  
CODEN: PSRMA6 9 REFS.  
Subfile: B  
Country of Publ.: Varies  
Doc Type: SERIAL; CONFERENCE PUBLICATION Bibliographic  
Level: ANALYTIC  
Languages: English  
illus.; table  
Descriptors: rock mechanics; slope stability; fractures  
; materials; properties; failure; stress; joints;  
models; probability; fracture zones; materials; properties  
; strength; shear strength; mathematical models  
; Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

89B431 78-31959

**Probability analysis of rock slopes and its application to a pit slope design**

Young, D. S.  
Kennecott Copper Corp., Salt Lake City, Utah, USA  
**Energy resources and excavation technology; proceedings, 18th U. S. symposium on rock mechanics**  
Wang, F. D. (EDITOR); Clark, G. B. (EDITOR)  
Energy resources and excavation technology; 18th U. S. symposium on rock mechanics, Keystone, Colo., United States.

June 22-24, 1977

Publ: Colo. Sch. Mines Press  
SC5.1-5C5.6p., 1977

5 REFS.

Subfile: B

Country of Publ.: United States  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.; tables

Descriptors: slope stability; failure; site exploration  
; methods; statistical analysis; probability; excavations;  
design

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

89B397 78-31776

**Probability of specified ground vibrations from blasting**

Lutton, R. J.  
USAE Waterways Exp. Stn., Vicksburg, Miss., USA

**Energy resources and excavation technology; proceedings, 18th U. S. symposium on rock mechanics**

Wang, F. D. (EDITOR); Clark, G. B. (EDITOR)

Energy resources and excavation technology; 18th U. S. symposium on rock mechanics, Keystone, Colo., United States.

June 22-24, 1977

Publ: Colo. Sch. Mines Press

3C2.1-3C2.7p., 1977

7 REFS.

Subfile: B

Country of Publ.: United States  
Doc Type: BOOK; CONFERENCE PUBLICATION Bibliographic

Level: ANALYTIC

Languages: English

illus.; tables; sect.

Descriptors: explosions; effects; ground motion;  
construction; elastic waves; velocity; vibration

Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

89AIG5 78 31843

**Slope stability analysis and design based on probability techniques at Cassiar Mine**

Piteau, D. R.; Martin, D. C.  
D. R. Piteau and Assoc. Ltd., West Vancouver, B.C., USA  
Can. Inst. Min. Met., Trans. 80, 51-62p., 1977  
CODEN: ICIMAT 5 REFS.  
Subfile B  
Country of Pub.: Canada  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English  
illus., tables, sects.  
Latitude: N550000; N612000 Longitude: W1260000; W1320000  
Descriptors: \*mining geology; \*slope stability; \*British Columbia; \*practice; \*site exploration; \*engineering geology; \*open-pit mining; Cassiar Mine; Sylvester Group; ground water; rock mechanics; design; Canada  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

779570 76-05816

**Seguranca e coeficiente de segurança em geotecnia Safety and safety factor in engineering geology**

Maschietto, U.; Branco Falcao, Castel  
Geotecnia (Agrupamento Port. Mec. Solos Rochas) 1, 31-46 p., 1971  
Subfile B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: Portuguese Summary Languages: English  
illus, table  
Descriptors: \*engineering geology; \*rock mechanics; \*rocks; \*brittle; \*deformation; \*cohesion; \*mathematical models; \*probability; \*failure; \*safety  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

774542 76-00788

**A probabilistic approach to geologic investigations for hard-rock tunnels**

Vick, Steven G.; Einstein, Herbert H.  
Dames and Moore, Salt Lake City, Utah, USA  
Int. Soc. Rock Mech., Congr. Proc. 3, Vol. 2, Part B  
Advances in Rock Mechanics: reports of current research,  
Tring, 10:75p., 1974  
CODEN: 327UAA  
Subfile A  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
illus.  
Descriptors: \*engineering geology; \*tunnels; \*theoretical studies; \*methods; \*prediction; \*conditions; \*rock mechanics; \*hard rocks; \*probability analysis  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

774528 76-00774

**Probability of pillar failure at Elliot Lake**

Coates, D. F.  
Int. Soc. Rock Mech., Congr. Proc. 3, Vol. 2, Part B:  
Advances in rock mechanics: reports of current research,  
990-996p., 1974  
CODEN: 327UAA  
Subfile: B  
Doc Type: SERIAL Bibliographic Level: ANALYTIC  
Languages: English Summary Languages: French  
Descriptors: \*Ontario; \*engineering geology; \*rock mechanics; Elliot Lake; mining geology; excavations; subsurface; pillars; strength; failure; field studies; Canada  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

507225 69-10519

**O vozmozhnosti ispol'zovaniya teorii veroyatnostey diya resheniya nekotorykh zadach inzhenernoy geologii Use of probability theory for the solution of some problems in engineering geology**

Kolomenskiy, Ye. N.  
Mosk. Univ., Vestn., Ser. 4, Geol. Vol. 23, No. 2, p. 85-90, illus., 1968  
Subfile: B  
Doc Type: SERIAL  
Languages: Russian  
Physical and mechanical properties of rocks, models  
Descriptors: \*Engineering geology; \*Rock mechanics;  
Methods: probability theory  
Section Headings: 22 (ENGINEERING & ENVIRONMENTAL GEOLOGY)

426027 66-12120-G

**THE PROBABILISTIC NATURE OF FAILURE IN THE GEOLOGIC UNIVERSE. IN INTERNAT. CONF. STRATA CONTROL AND ROCK MECHANICS, 4TH, NEW YORK, 1964, PROC.**

WANE, MALCOLM T.; HASSIALIS, MENELAOS D.; BOSHMOV, STEFAN.  
NEW YORK, COLUMBIA UNIV. PRESS, P. 324-329, 1964 (1965)  
Subfile: C  
Descriptors: \*FAILURE; \*PROBABILITY; \*ROCK MECHANICS;  
\*STATISTICAL CONCEPTS; \*STRENGTH

416980 56-05020 N

The effect of stress concentrations on the stability of tunnels  
Coates, D. F.

In Internat. Soc. Rock Mechanics Congress, 1st, Lisbon, 1966, Proc., V. 2  
Lisbon, Portugal, Laboratorio Nacional Engenharia Civil O. 299-305, illus., tables, 1966  
Subfile: N

With French and German abs...  
Stress concentrations around an underground opening may theoretically exceed the strength of the rock mass. Deviations of actual rock properties from those of homogeneity and perfect elasticity can, however, modify theoretical stress distributions considerably. In addition, known variation of strength of rocks with volume of rock makes predictability of failure due to stress concentration questionable. Several experiments have been conducted which show that failure due to compressive stress concentrations can be predicted under favorable circumstances quite accurately. However, considering failure as a stochastic phenomenon, predictions should be in terms of probability of failure rather than certainty. As a result, it can be seen that a main requirement to improve correspondence between experimental and predicted results is to have better methods for determining mechanical properties of rock masses.

Descriptors: Engineering geology; Rock mechanics;  
Tunnels; failure; compressive stress; effect; Stability;  
stress concentration in rock

409214 65-12410-N

The probabilistic nature of failure in the geologic universe  
Wane, Malcolm T.; Hassialis, Menelaos D.; Boshkov, Stefan

In Internat. Conf. Strata Control and Rock Mechanics, 4th, New York, 1964, Proc.  
New York, Columbia Univ. Press p. 324-329, illus., 1964,  
1965

Subfile: N  
Descriptors: Statistical methods; Engineering geology;  
Probability applied to rock strength

